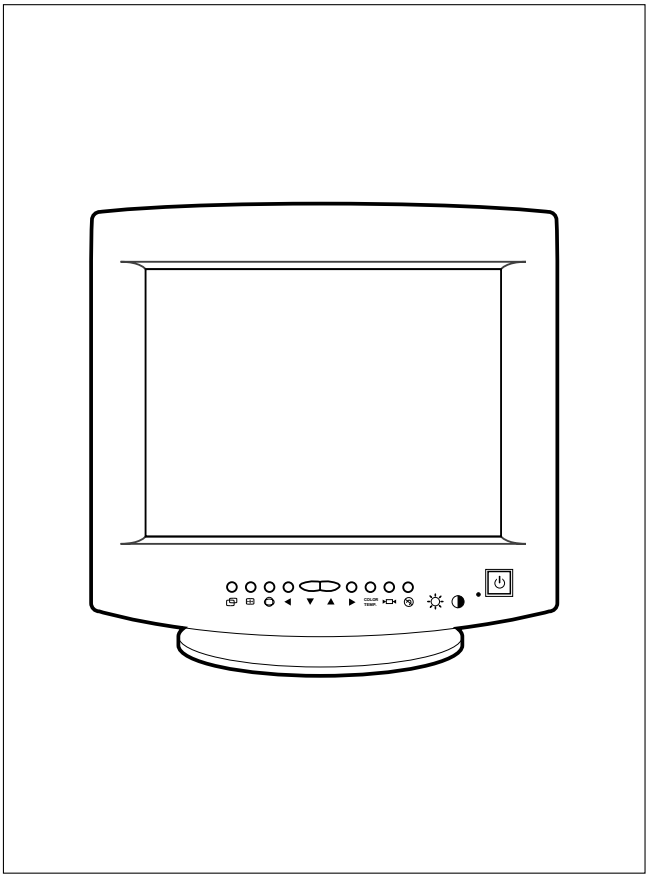
SAMSUNG

COLOR MONITOR

CKG7507L
(SyncMaster 700s Plus)

SERVICE Manual

COLOR MONITOR



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1 Precautions

1-1 Safety Precautions

WARNINGS

1. For continued safety, do not attempt to modify the circuit board.
2. Disconnect the AC power before servicing.
3. When the chassis is operating, semiconductor heatsinks are potential shock hazards.

1-1-1 Servicing the High Voltage VR and CRT :

WARNING: A high voltage VR replaced in the wrong direction may cause excessive X-ray emissions.

Caution: When replacing the high voltage adjustment VR, it must be fixed by a soldering iron after it is properly set.

1. When servicing the high voltage system, remove the static charge by connecting a 10 kohm resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead.
2. If the HV VR requires adjustment, (a) Replace the VR and adjust the high voltage to the specification. (b) Use a soldering iron to melt the adjustment cap on the HV VR to prevent any movement.
3. When troubleshooting a monitor with excessively HV, avoid being unnecessarily close to the monitor. Do not operate the monitor for longer than is necessary to locate the cause of excessive voltage.
4. High voltage should always be kept at the rated value, no higher. Only when high voltage is excessive are X-rays capable of penetrating the shell of the CRT, including the lead in glass material. Operation at high voltages may also cause failure of the CRT or high voltage circuitry.
5. When the HV regulator is operating properly, there is no possibility of an X-ray problem. Make sure the HV does not exceed its specified value and that it is regulating correctly.
6. The CRT is especially designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the CRT only with one that is the same or equivalent type as the original.
7. Handle the CRT only when wearing shatterproof goggles and after completely discharging the high voltage anode.
8. Do not lift the CRT by the neck.

1-1-2 Fire and Shock Hazard :

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check (Figure 1-1):
   WARNING: Do not use an isolation transformer during this test.
   Use a leakage current tester or a metering system that complies with American National Standards Institute (*ANSI C101.1, Leakage Current for Appliances*), and Underwriters Laboratories (*UL Publication UL1410, 59.7*).
4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

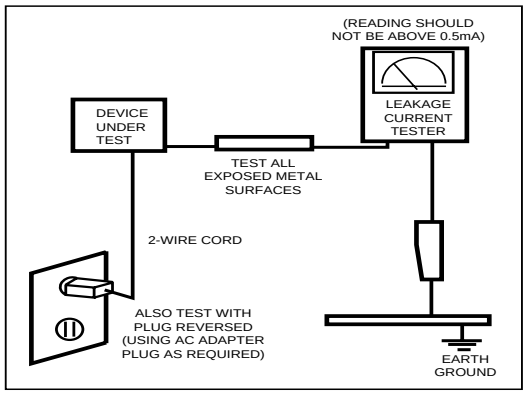

(READING SHOULD NOT BE ABOVE 0.5mA)
LEAKAGE CURRENT TESTER
DEVICE UNDER TEST
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
EARTH GROUND

Figure 1-1. Leakage Current Test Circuit

1-1-4 Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and / or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

Components identified by ☢ on schematics and parts lists must be sealed by a soldering iron after replacement and adjustment.

1-2 Servicing Precautions

WARNING1: First read the "Safety Precautions" section of this manual. If unforeseen circumstances create conflict between the servicing precautions and safety precautions, always follow the safety precautions.

WARNING2: A high voltage VR replaced in the wrong direction may cause excessive X-ray emissions.

WARNING3: An electrolytic capacitor installed with the wrong polarity might explode.

1. Servicing precautions are printed on the cabinet, and should be followed closely.
2. Always unplug the unit's AC power cord from the AC power source before attempting to: (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect all test components in parallel with an electrolytic capacitor.
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the +B voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect a test instrument's ground lead to the instrument chassis ground *before* connecting the positive lead; always remove the instrument's ground lead last.

1-3 Electrostatically Sensitive Devices (ESD) Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution: Be sure no power is applied to the chassis or circuit and observe all other safety precautions.
8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.
9. ⚠ Indicates ESDs on the Schematic Diagram in this manual.

2 Reference Information

2-1 List of Abbreviations, Symbols and Acronyms

2-1-1 Abbreviations

Abbreviation	Definition
ASS'Y	Assembly
B	Blue
B+ ADJ	B+ Adjustment
B-CUT	Blue-Cutoff
B-GAIN	Blue Gain
BRIGHT	Brightness
C	R-Composition
C-MIC	Condenser Microphone
CLK	Clock
CM	R-Cement
CN	Connector
CONT	Contrast
D-SUB	D-Subminiature
EEP-CLK	Electrically Erasable and Programmable Clock
EXT	External
EXT-MIC	External Microphone
Freq.	Frequency
FU	Fusible
G	Green
G-CUT	Green-Cutoff
G-GAIN	Green Gain
GND	Ground
H	Horizontal
H	Heater
H-DRV	Horizontal Drive
H-DY	Horizontal Deflection York
H-FLB	Horizontal Flyback
H-FV	Horizontal-Feedback Voltage
H-LIN	Horizontal Linearity
H-POSI	Horizontal Position
H-SIZE	Horizontal Size
H/PHONE	Headphone
Hz	Hertz
I-SENSE	Current-Sense
Ib	Pound
MAX	Maximum
MIC	Microphone
MIN	Minimum
MP	C-Metalized Polyester
MPP	Metal Polypropylene
MO	R-Metal Oxide

Abbreviation	Definition
OSC	Oscillator
P	C-Polyester
PARA	Parabola
PARALL	Parallelogram
PIN-BAL	Pincushion Balance
PRE-AMP	Pre-Amplifier
PS1	Power Saving1 (suspend)
PS2	Power Saving2 (off)
PWR	Power
R	Red
R-CUT	Red-Cutoff
R-GAIN	Red Gain
RST	Reset
S-PIN	Side Pincushion
S-RASTER	Self Raster
S/W	Switch
SCAP	S Correction Capacitor
SPK	Speaker
SYNC	Synchronization
T	C-Tantalum
TR	Transistor
TRAP	Trapezoid
U-COM	Microprocessor
V	Vertical
V-DY	Vertical Deflection York
V-FLB	Vertical Flyback
V-LIN	Vertical Linearity
V-MUTE	Video Mute
V-OUT	Vertical Output
V-PARA	Vertical Parabola
V-POL	V-Polarity
V-POSI	Vertical Position
V-SENSE	Voltage-Sense
V-SIZE	Vertical Size
WW	R-Wire Wound
X-TAL	Crystal
Ω	ohm
KΩ	1000 ohm
MΩ	1000 KΩ
uF	microfarad (10^{-6}F)
nF	nanofarad (10^{-9}F)
pF	picofarad (10^{-12}F)

3 Product Specifications

3-1 Specifications

Item	Description
Picture Tube:	17-Inch (43 cm): 15.7-inch (39.80 cm) viewable; Full-square flat-face tube, 90˚ Deflection, 0.28 mm Dot pitch, Semi- tint, Non-glare, Invar shadow mask, Anti-static silica coating
Scanning Frequency	Horizontal : 30 kHz to 70 kHz (Automatic) Vertical : 50 Hz to 160 Hz (Automatic)
Display Colors	Unlimited colors
Maximum Resolution	Horizontal : 1280 Dots Vertical : 1024 Lines
Input Video Signal	Analog, 0.714 Vp-p positive at 75 Ω, internally terminated
Input Sync Signal	Separate Sync : TTL level positive/negative Composite Sync : TTL level positive/negative
Maximum Pixel Clock rate	110 MHz
Active Display	Horizontal : 306 mm ± 3 mm (4:3 ratio) Vertical : 230 mm ± 3 mm
Input Voltage	AC 90 to 264 Volts, 60 Hz or 50 Hz ± 3 Hz
DC Output	DC 12 Volt (CKG7507LM)
Power Consumption	100 Watt (max)
Dimensions Unit (W x D x H) Carton (W x D x H)	 16.7 x 17.5 x 16.7 Inches (424 x 446 x 425 mm) 21.5 x 21.9 x 21.2 Inches (545 x 554 x 538 mm)
Weight	38.7 lbs (17.4 kg) / 48.5 lbs (22.0 kg)
Environmental Considerations	Operating Temperature : 32°F to 104°F (0°C to 40°C) Humidity : 10 % to 80 % Storage Temperature : -4°F to 113°F (-20°C to 45°C) Humidity : 5 % to 95 %
• Above models comply with SWEDAC (MPR II) recommendations for reduced electromagnetic fields. • Designs and specifications are subject to change without prior notice.	

3-2 Pin Assignments

Sync Type / Pin No.	15-Pin Signal Cable Connector (Figure 3-1)		Cable Adapter (Figure 3-2)
	Separate	Composite	Macintosh
1	Red	Red	GND-R
2	Green	Green	Red
3	Blue	Blue	H/V Sync
4	GND	GND	Sense 0
5	DDC Return	DDC Return	Green
6	GND-R	GND-R	GND-G
7	GND-G	GND-G	Sense 1
8	GND-B	GND-B	Reserved
9	Reserved	Reserved	Blue
10	GND-Sync/Self-raster	GND-Sync/Self-raster	Sense 2
11	GND	GND	GND
12	DDC Data	DDC Data	V-Sync
13	H-Sync	H/V-Sync	GND-B
14	V-Sync	Not Used	GND
15	DDC Clock	DDC Clock	H-Sync

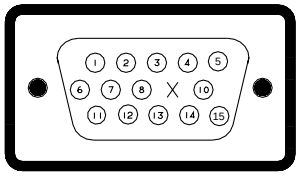


Figure 3-1. Male Type

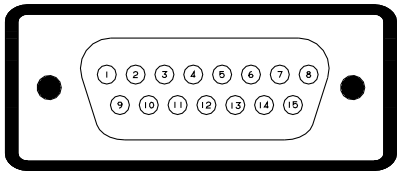


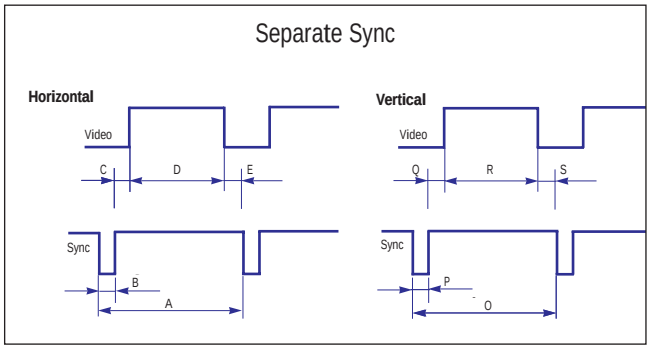
Figure 3-2. Male Type

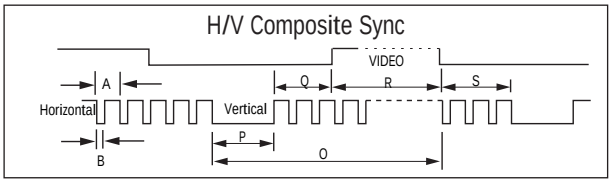
3-3 Timing Chart

This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

Table 3-1. Timing Chart

Mode / Timing	IBM		VESA					Apple MAC.
	VGA2/70 Hz 720 x 400	VGA3/60 Hz 640 x 480	640/75 Hz 640 x 480	800/75 Hz 800 x 600	800/85Hz 800 x 600	1024/75 Hz 1024 x 768	1024/85 Hz 1024 x 768	832/75 Hz 832 x 624
fH (kHz)	31.469	31.469	37.500	46.875	53.674	60.023	68.677	49.726
A µsec	31.778	31.778	26.667	21.333	18.631	16.660	14.561	20.110
B µsec	3.813	3.813	2.032	1.616	1.138	1.219	1.016	1.117
C µsec	1.907	1.907	3.810	3.232	2.702	2.235	2.201	3.910
D µsec	25.422	25.422	20.317	16.162	14.222	13.003	10.836	14.524
E µsec	0.636	0.636	0.508	0.323	0.569	0.203	0.508	0.559
fv (Hz)	70.087	59.940	75.000	75.000	85.061	75.029	84.997	74.551
O msec	14.268	16.683	13.333	13.333	11.756	13.328	11.765	13.414
P msec	0.064	0.064	0.080	0.064	0.056	0.050	0.044	0.060
Q msec	1.080	1.048	0.427	0.448	0.503	0.466	0.524	0.784
R msec	12.711	15.253	12.800	12.800	11.179	12.795	11.183	12.549
S msec	0.413	0.318	0.027	0.021	0.019	0.017	0.015	0.020
Clock Freq. (MHz)	28.322	25.175	31.500	49.500	56.250	78.750	94.500	57.284
Polarity H.Sync	Negative	Negative	Negative	Positive	Positive	Positive	Positive	Negative
V.Sync	Positive	Negative	Negative	Positive	Positive	Positive	Positive	Negative
Remark	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Composite





A : Line time total	B : Horizontal sync width	O : Frame time total	P : Vertical sync width
C : Back porch	D : Active time	Q : Back porch	R : Active time
E : Front porch		S : Front porch	

Memo

2-1-2 Symbols

- Can emit X-radiation
- Hot Ground
- Cold Ground
- Electrostatically Sensitive Device (ESD)
- Provides special safety considerations

2-1-2 Acronyms

Acronym	Definition
ABL	Automatic Brightness Limits
AC	Alternating Current
ACL	Automatic Contrast Limit
AFC	Automatic Frequency Control
ANSI	American National Standards Institute
CMOS	Complementary Metal Oxide Semiconductor
CRT	Cathode Ray Tube
DC	Direct Current
DDC	Data Display Channel
DF	Dynamic Focus
DMM	Digital Multimeter
DPMS	Display Power Management Signaling
DVM	Digital Voltmeter
DY	Deflection York
EEPROM	Electrically Erasable and Programmable Read only Memory
ESD	Electrostatically Sensitive Device
ESF	Electronic Static Field
FBT	Flyback Transformer
FET	Field Effect Transistor
FH	Horizontal Frequency
FS	Fail Safe
FV	Vertical Frequency
GD	Geometric Distortion

Acronym	Definition
H/V	Horizontal/Vertical
HV	High Voltage
I/O	Input/Output
IC	Integrated Circuit
LED	Light Emitting Diode
MAC	Macintosh
MOFA	Mask Outside Frame Assemble
OCP	Over Current Protection
OP AMP	Operational Amplifier
OSD	On Screen Display
P-P	Peak to Peak
PCB	Printed Circuit Board
PLL	Phase Locked Loop
PWM	Pulse Width Modulation
SMPS	Switch Mode Power Supply
SVGA	Super Video Graphics Array
SWEDAC	
TP	Test Point
UL	Underwriters Laboratories
USB	Universal Serial Bus
VESA	Video Electronics Standard Association
VGA	Video Graphics Array
VR	Variable Registor
W/B	White Balance

4 Opearating Instructions

4-1 Front View and Control

4-1-1 CKG7507L Front View

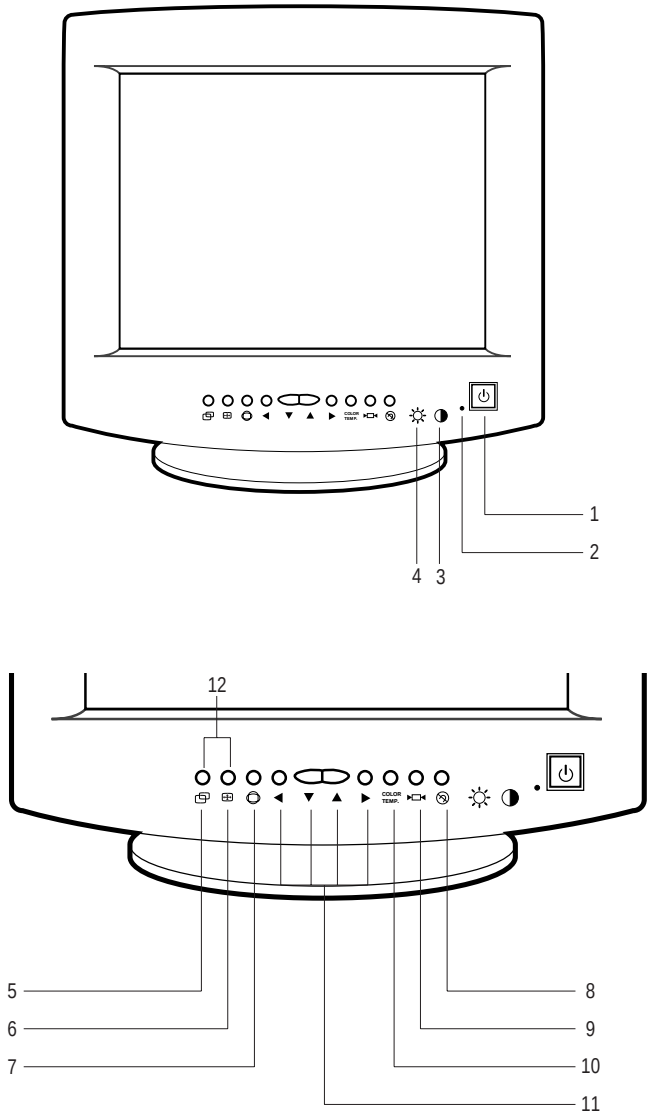


Figure 4-1. Front Control Panel

Table 4-1. Front Panel Controls

Location	Symbol	Description
1	⏻	Power Button
2	●	Power Indicator LED (Dual Color)
3	◑	Contrast Control
4	☼	Brightness Control
5		Position and Modes Push once: Position (Horizontal/Vertical) Push twice: User and Preset Modes
6		Size (Horizontal/Vertical)
7		G/D (Geometric Distortion) Push once: Pincushion/Trapezoid Push twice: Parallelogram/Tilt
8		Degauss Button
9	▶▭◀	Recall Button
10	COLOR TEMP	Color Temperature Control
11	◀▶▼▲	Adjustment Buttons
12	+	Pinbalance and Vertical Linearity

4-1-2 On Screen Display

This monitor features an On-Screen Display (OSD) that shows information about the display setting. The OSD appears on the screen when you select a function button. The OSD shows the name, range and current setting of the control function. In addition, the OSD shows the current input signal frequency and the list of user and factory preset timings. The OSD remains active for approximately 8 seconds after the completion of any adjustment.

Note 1: This monitor requires a cable adapter for use with a Macintosh computer. The MacMaster Cable Adapter supports all monitors and all Macintosh, Centris, Quadra, Duo Dock, and Power Macintosh computers. If you do not already have a cable adapter, check with your computer dealer.

Note 2: When used with a computer equipped with VESA DPMS functions, this monitor is EPA Energy Star compliant and NUTEK compliant.

Table 4-2. Display Power Management Signaling (DPMS)

State / Items	Normal Operation	Power saving function EPA/NUTEK		
		Stand-By Mode	Suspend Mode Position A	Power Off Mode Position B
Horizontal Sync	Active	Inactive	Active	Inactive
Vertical Sync	Active	Active	Inactive	Inactive
Video	Active	Blanked	Blanked	Blanked
Power Indicator	Green	Amber	Alternating Amber/Green Blinking	Amber Blinking
Power Consumption/hr	100 W (max.) 80.8 W (nominal)	70 W (max.) 66.5 W (nominal)	Less than 15 W	Less than 8 W

5 Disassembly and Reassembly

This section of the service manual describes the disassembly and reassembly procedures for the CKG7507L monitor.

WARNING: This monitor contains electrostatically sensitive devices. Use caution when handling these components.

5-1 Disassembly

Cautions:1. Disconnect the monitor from the power source before disassembly.
2. Follow these directions carefully; never use metal instruments to pry apart the cabinet.

5-1-1 Cabinet Disassembly

1. With a pad beneath it, stand the monitor on its front with the screen facing downward and the base close to you. Make sure nothing will damage the screen.
2. Working from the back of the monitor, remove the 4 screws and carefully pull the rear cabinet up and off the monitor.
3. Remove the 4 screws on the Bottom Cover and pull it upward to remove it.
4. Remove the 16 screws on the Top Shield and remove it.
5. Using pinch-nosed pliers or long-nosed pliers, carefully disconnect the Anode Cap from the CRT.

5-1-2 Removing the Video PCB

1. Follow steps 1 through 5 in “Cabinet Disassembly,” above.
2. Disconnect connectors CN102, CN105 and CN106 on the Video PCB.
3. Remove both side screws on the lower edge of the Video PCB Ass’y and the screw on the signal connector and pull the assembly towards you to remove it.
4. Remove all screws on the Video PCB Ass’y and remove the Video Shield.
5. Lift out the Video PCB and place it on a flat, level surface that is protected from static electricity.

5-1-3 Removing the CRT Socket PCB

1. Follow steps 1 through 5 in “Cabinet Disassembly,” and steps 1 through 5 in “Removing the Video PCB,” above.
2. Disconnect connectors CN13 and CN14 on the CRT Socket PCB.
3. Lift off the CRT Socket PCB Ass’y.
4. Hold the CRT Socket PCB Ass’y while you lift the cap on the CRT Socket and pull out the two focus wires.

5-1-4 Removing the Main PCB

1. Follow steps 1 through 5 in “Cabinet Disassembly,” steps 1 through 5 in “Removing the Video PCB,” and steps 1 through 4 in “Removing the CRT Socket PCB,” above.
2. Disconnect the Degaussing Coil at CN602 on the Main PCB.
3. Disconnect all easily accessible ground wires from the Main PCB and Bottom Chassis.
4. Disconnect the DY connector between the DY and the CN301, CN400, CN401 and CN402 connectors on the Main PCB.
5. Remove the 2 screws on the left and right sides of the PCB Bracket.
6. Carefully lift the Main PCB Ass’y.
7. Disconnect the CN201 on the Main PCB and LED connector CN702 on the LED PCB.
8. Remove the Power Shaft.
9. Remove the 6 screws on the top side of the Main PCB.
10. Remove the 2 screws on the Power Inlet Socket.
11. Lift the Main PCB and place it on a flat, level surface that is protected from static electricity.

5-1-5 CRT Ass'y Disassembly

1. Complete all previous steps.
2. Remove the 4 side screws 2 on the top and 1 on either side of the CRT and lift the CRT Unit Bracket.
3. Unhook the Degaussing Coil Assembly and lift it off the CRT.
4. Lift the CRT up and away from the Front Cover Assembly and place it on a padded surface.

⚠ **Do not lift the CRT by the neck.**

Caution: If you will be returning this CRT to the monitor, be sure to place the CRT face down on a protective pad.

5-2 Reassembly

With the CRT facing downward on a protective pad, use the steps that follow to reassemble the monitor.

5-2-1 Replacing the CRT

1. Loop the CRT Ground Assembly around the back of the CRT and under the 4 corner, metal ears. Position the corner with the spring last.
2. With the Front Cover Assembly lying face down on a protective pad, position the CRT so that the corner metal ears fit properly in the Front Cover Assembly.
3. Replace the Degaussing Coil Assembly and secure the Coil with the plastic Degaussing Coil Holders.
4. Replace the Unit Bracket Ass'y.
5. Replace the 4 corner screws.

5-2-2 Replacing the Main PCB

1. Stand the monitor on its front with the screen facing downward.
2. Replace the 6 screws on the top side of the Main PCB and the 2 screws on the power Inlet Socket.
3. Replace the Power Shaft.
4. Replace connector CN201 on the Main PCB and Led connector CN702 on the LED PCB.
5. Position the Main PCB Ass'y in the Front Cabinet and secure it on both sides with the screws between the Bottom Chassis and CRT Unit Bracket.
6. Replace the DY connector at the CN301, CN400, CN401 and CN402 connectors on the Main PCB.
7. Replace all easily accessible ground wires on the Main PCB and Bottom Chassis.
8. Replace the Degaussing Coil at CN602 on the Main PCB.
9. Replace the Anode Cap.

5-2-3 Replacing the CRT Socket PCB

1. Hold the CRT Socket PCB Ass'y while you lift the Cap on the CRT Socket and replace the two Focus wires.
2. Replace connectors CN13 and CN14 on the CRT Socket PCB.
3. Reconnect the CRT Socket on the CRT pins at the plug/Socket junction.

5-2-4 Replacing the Video PCB.

1. Position the Video Shield and replace all screws.
2. Replace both side screws on the lower edge of the Video PCB Ass'y and the screw on the signal connector.
3. Replace connectors CN102, CN105 and CN106 on the Video PCB.

5-2-5 Cabinet Reassembly

1. Complete all previous steps.
2. Position the Top Shield and replace the 12 screws.
3. Replace the 4 screws on the Bottom Cover.
4. Position the Rear Cover making sure that the tabs along the front edge are properly snapped in place. Replace the 4 screws.
5. Set the monitor on its Base and make sure that the CRT faceplate was not scratched or otherwise damaged.

6 Alignment and Adjustments

This section of the service manual explains how to make permanent adjustments to the monitor. Directions are given for adjustments using the monitor Interface Board Ver. 2.0 and software (SoftJig).

6-1 Adjustment Conditions

Caution: Changes made without the SoftJig are saved only to the user mode settings. As such, the settings are not permanently stored and may be inadvertently deleted by the user.

6-1-1 Before Making Adjustments

6-1-1 (a) ORIENTATION

When servicing, always face the monitor to the east.

6-1-1 (b) MAGNETIC FIELDS

Whenever possible, use magnetic field isolation equipment such as a Helmholtz field to surround the monitor. If a Helmholtz field is not available, frequently degauss the unit under test.

Caution: Other electrical equipment may cause external magnetic fields which may interfere with monitor performance.

Use an external degaussing coil to limit magnetic build up on the monitor. If an external degaussing coil is not available, use the internal degaussing circuit. However, do not use the internal degaussing circuit more than once per 30 minutes.

6-1-1 (c) WARM-UP TIME

The monitor must be on for 30 minutes before starting alignment. Warm-up time is especially critical in color temperature and white balance adjustments.

6-1-1 (d) SIGNAL

Analog, 0.714 Vp-p positive at 75 ohm, internal termination
Sync: Separate / Composite
(TTL level negative / positive)

Sync-on-Green:
Composite sync 0.286 Vp-p negative
(Video 0.714 Vp-p positive)

6-1-1 (e) SCANNING FREQUENCY

Horizontal: 30 kHz to 70 kHz (Automatic)
Vertical: 50 Hz to 160 Hz (Automatic)

Unless otherwise specified, adjust at the 1024 x 768 mode (H: 60 kHz, V: 75 Hz) signals.

Refer to Table 2-1 on page 3-3.

6-1-1 (f) HIGH VOLTAGE ADJUSTMENT

Signal: No signal
Display image: Self raster
Contrast: Maximum
Brightness: Maximum
Limit: 26 kV ± 0.5 kV

Measure the hight voltage level at the anode cap. High voltage should be within the limit as above. If the high voltage needs adjustment use the following procedure.

PROCEDURE

1. Turn the power off and disconnect the AC line cord from the power source.
2. Unsolder and remove VR501 on the Main PCB.
3. Replace VR501 and adjust the high voltage to the specification.
4. Using a soldering iron, melt the adjustment cap on VR501 to prevent any movement.

6-1-1 (g) G2 (SCREEN) VOLTAGE ADJUSTMENT

Signal: No signal
Display image: Self raster
Contrast: Maximum
Brightness: Maximum

Adjust the Screen VR of the FBT so that the G2 (Screen) Voltage for SDD CRT is 430 V ± 10 V.

6-1-1 (h) HORIZONTAL FREE-RUN FREQUENCY ADJUSTMENT

Signal: 60 kHz / 75 Hz
Contrast: Maximum
Brightness: Maximum

Connect the Frequency counter probe to the H-DY (Red wire). Conncet pin 26 of IC401 to the Ground. Adjust VR 402 to 58.7 kHz ± 10 Hz.

6-1-1 (I) CENTER RASTER

Adjust SW401 so that the back raster comes to the center when you apply a signal of 60 kHz / 75 Hz.

6-1-1 (J) BRIGHTNESS AND CONTRAST

Unless otherwise specified, adjust external VRs:

Brightness: Maximum (turn knob fully clockwise)
Contrast: Maximum (turn knob fully clockwise)

6-1-2 Required Equipment

The following equipment may be necessary for adjustment procedures:

6-1-2 (a) DISPLAY CONTROL ADJUSTMENT

1. Non-metallic (–) screwdriver: 1.5 mm
   Non-metallic (–) screwdriver: 3 mm
2. Philips (+) screwdriver: 1.5 mm
3. Non-metallic hexkey: 2.5 mm
4. Digital Multimeter (DMM), or
   Digital Voltmeter (DVM)
5. Signal generator, or
   Computer with a video board that uses the ET-4000 chipset (strongly recommended if using Samsung DM 200 software) and that displays: 1024 x 768 @ 75 Hz, or 800 x 600 @ 75 Hz (minimum).
6. Personal computer
7. Required software: Softjig.exe from Samsung which includes the cg17e.c data file Samsung DM200, or DisplayMate for Windows from Sonera Technologies
8. Interface Board Ver. 2.0 Code No. BH81-90001K
9. Parallel communications cable (25-pin to 25-pin); Code No. BH81-90001H
10. Signal cable (15-pin to 15-pin cable with additional 3-pin connector); Code No. BH81-90001J
11. 5 V DC adapter, not supplied

Note: SoftJig Ass'y (includes items 8, 9 and 10) Code No. BH81-90001L

6-1-2 (b) COLOR ADJUSTMENTS

1. All equipment listed in 6-1-2 (a), above
2. Color analyzer, or any luminance measurement equipment

6-1-3 Connecting the SoftJig

Connect the monitor to the signal generator and / or PC as illustrated in Figures 6-1 and 6-2.

Refer to Softjig Manual.

Note: The signal cable connector which includes the 3-wire cable must connect to the monitor. If you use Setup 2 (PC only, no signal generator) you can only make adjustments to the signal timing available on that computer system. To make corrections to all factory timings requires the use of an additional signal generator.

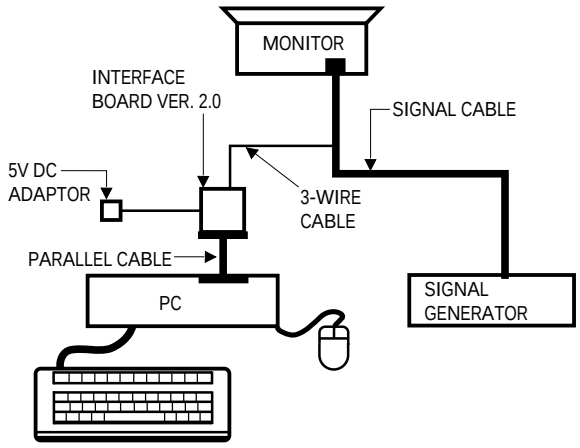


Figure 6-1. Setup 1, With Signal Generator

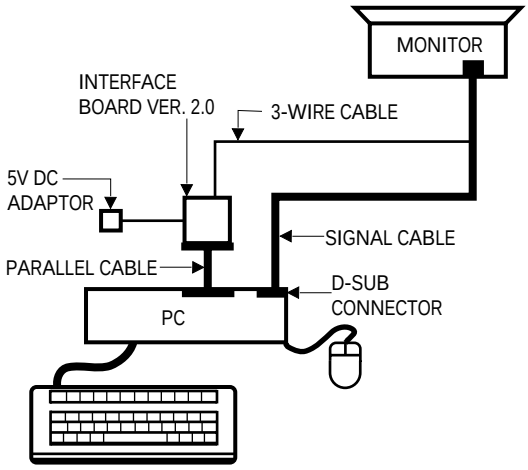


Figure 6-2. Setup 2, Without Signal Generator

6-1-4 After Making Adjustments

After finishing all adjustments, test the monitor in all directions. If, for example, the monitor does not meet adjustment specifications when facing north, reposition the monitor to face east and readjust. This time, try for an adjustment closer to the ideal setting within the tolerance range. Test the unit again in all directions. If the monitor again fails to meet specifications in every direction, contact your Regional After Service Center for possible CRT replacement.

6-2 Using the SoftJig

Refer to Softjig Manual.

6-3 Display Control Adjustments

6-3-1 Centering

Centering means to position the center point of the display in the middle of the display area. Horizontal size and position and vertical size and position control the centering of the display.

Adjust the horizontal size and vertical size to their optimal settings: 306 mm (H) x 230 mm (V).

Adjust the horizontal position and vertical position to ≤ 4.0 mm of the center point of the screen.

|A-B| ≤ 4.0 mm.
|C-D| ≤ 4.0 mm.

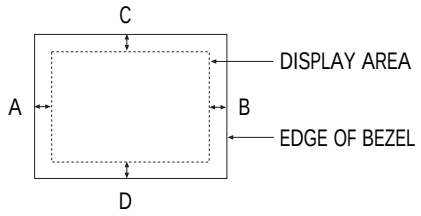


Figure 6-3. Centering

6-3-1 (a) HORIZONTAL SIZE ADJUSTMENT

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Crosshatch pattern
Brightness:	Maximum
Contrast:	Maximum

Click on the << or >> box next to **H_SIZE** to adjust the horizontal size of the display pattern to 306 mm. (Tolerance: ± 3 mm.)

Caution: Must be adjusted first of all the H_SIZE to 306 mm ± at VGA2 (31 kHz/70 Hz). Because all mode variable H_SIZE range is based on the adjusted factory data of VGA2.

6-3-1 (b) VERTICAL SIZE ADJUSTMENT

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Crosshatch pattern
Brightness:	Maximum
Contrast:	Maximum

Click on the << or >> box next to **V_SIZE** to adjust the vertical size of the display pattern to 230 mm. (Tolerance: ± 3 mm.)

6-3-1 (c) HORIZONTAL POSITION ADJUSTMENT

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Crosshatch pattern

Click on the << or >> box next to **H_POSI** to center the horizontal image on the raster.

6-3-1 (d) VERTICAL POSITION ADJUSTMENT

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Crosshatch pattern

Click on the << or >> box next to **V_POSI** to center the vertical image on the raster.

6-3-2 Linearity

Linearity affects the symmetry of images as they appear on the screen. Unless each row or column of blocks in a crosshatch pattern is of equal size, or within the tolerances shown in Tables 6-2 and 6-3, an image appears distorted, elongated or squashed.

Table 6-1. Standard Modes Linearity: 640x480/75Hz, 800x600/85Hz and 1024x768/85Hz

	Standard Modes Linearity	
	Each block (10 %)	Difference between adjacent blocks (4 %)
4 : 3	Horizontal: 18.2~20.1 Vertical : 18.2~20.1	Horizontal: Less than 0.77 mm Vertical : Less than 0.77 mm
5 : 4	Horizontal: 17.1~18.9 Vertical : 18.2~20.1	Horizontal: Less than 0.72 mm Vertical : Less than 0.77 mm

Table 6-2. Other Modes Linearity: VGA, SVGA, XGA, MAC, etc.

	Supported Timing Mode	
	Each block (14 %)	Difference between adjacent blocks (5 %)
4 : 3	Horizontal: 17.8~20.5 Vertical : 17.8~20.5	Horizontal: Less than 0.96 mm Vertical : Less than 0.96 mm
5 : 4	Horizontal: 16.7~19.2 Vertical : 17.8~20.5	Horizontal: Less than 0.90 mm Vertical : Less than 0.96 mm

6-3-2 (a) HORIZONTAL LINEARITY ADJUSTMENT

The CKG7507L / LM monitors offer only Vertical Linearity adjustments. Horizontal Linearity is fixed on the Chassis and is not adjustable.

6-3-2 (b) VERTICAL LINEARITY ADJUSTMENT

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Crosshatch pattern
Brightness:	Maximum
Contrast:	Maximum

To adjust the Vertical Linearity, refer to Tables 6-1 and 6-2 for the tolerance range.

Click on the << or >> box next to **V_LIN** to optimize the image.

6-3-3 Trapezoid Adjustment

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Crosshatch pattern
Brightness:	Maximum
Contrast:	Maximum

Click on the << or >> box next to **TRAPE** to make the image area rectangular.

| A - B | < 4 mm

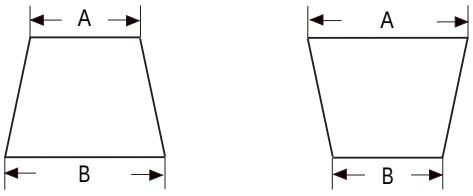


Figure 6-4. Trapezoid

6-3-4 Pinbalance Adjustment

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Crosshatch pattern
Brightness:	Maximum
Contrast:	Maximum

| D1 |, |D2 | ≤ 2 mm

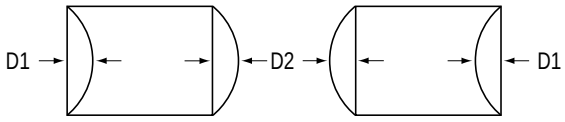


Figure 6-5. Pinbalance

Click on the << or >> box next to **PIN_BAL** to optimize the image.

6-3-5 Parallelogram Adjustment

CONDITIONS

Scanning Frequency:	60 kHz / 75 Hz
Display image:	Crosshatch pattern
Brightness:	Maximum
Contrast:	Maximum

Click on the << or >> box next to **PARALL** to make the image area rectangular.

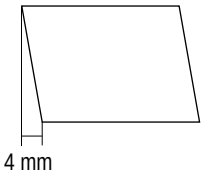


Figure 6-6. Parallelogram

6-3-6 Side Pincushion Adjustment

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Crosshatch pattern

Click on the << or >> box next to **BARREL** to straighten the sides of the image area.

| C1 |, | C2 | ≤ 2.0 mm, | D1 |, | D2 | ≤ 2.0 mm.

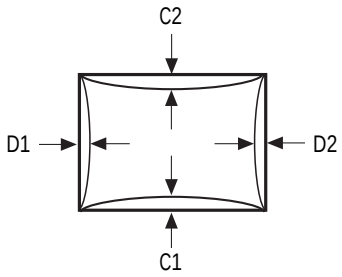


Figure 6-7. Pincushion

6-3-7 Tilt Adjustment

CONDITIONS

Scanning Frequency:	60 kHz / 75 Hz
Display image:	Crosshatch pattern
Brightness:	Maximum
Contrast:	Maximum

Click on the << or >> box next to **ROTATE** to correct the tilt of the display.

6-3-8 Degauss

No adjustments are available for the degaussing circuit. The degaussing circuit can effectively function only once per 30 minutes.

6-3-9 To Delete the User Mode Data

To delete the adjustment data from the user modes, click **USER DELETE.**

6-3-10 Save the Data

To save the adjustment data for a mode, press **FACTORY SAVE**.

6-4 Color Adjustments

6-4-1 Color Coordinates (Temperature)

Color temperature is a measurement of the radiant energy transmitted by a color. For computer monitors, the color temperature refers to the radiant energy transmitted by white. Color coordinates are the X and Y coordinates on the chromaticity diagram of wavelengths for the visible spectrum.

CONDITIONS

Measurement instrument:	Color analyzer
Scanning frequency:	60 kHz / 75 Hz
Display image:	White flat field at center of display area
Luminance:	Maximum

PROCEDURE

Use the directions in sections 6-4-2 through 6-4-3 to adjust the color coordinates for:
9300K to x = 0.283 ± 0.02, y = 0.298 ± 0.02
6500K to x = 0.313 ± 0.02, y = 0.329 ± 0.02

6-4-2 Color Adjustments for 9300K

6-4-2 (a) BACK RASTER COLOR ADJUSTMENT

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Back raster pattern
Brightness:	Maximum
Contrast:	Maximum

1. Select **COLOR CHANNEL 1** to control the color for 9300K.
2. Adjust the luminance of the back raster to between 0.4 to 0.5 ft-L using the **G_CUT** controls.
3. Click on the << or >> box next to **B_CUT** to set the "y" coordinate to 0.298 ± 0.02.
4. Click on the << or >> box next to **R_CUT** to set the "x" coordinate to 0.283 ± 0.02.

Note: If the above adjustments cannot be done to each coordinate, click on the << or >> box next to **G_CUT** to decrease or increase the green cutoff (bias) and repeat procedures 3 and 4.

6-4-2 (b) G-GAIN ADJUSTMENT

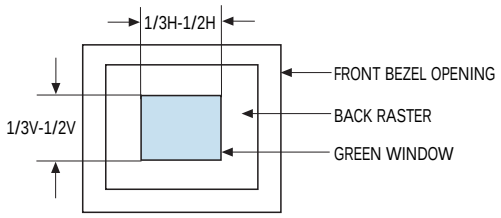


Figure 6-8. Green Box Pattern

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Green box pattern
Brightness:	Maximum
Contrast:	Maximum

1. Click on the << or >> box next to **G_GAIN** to adjust the brightness of the Green Gain to 38 ± 1 ft-L.

   Note: If you can't increase the Green Gain to the appropriate value, click on the >> box next to increase the **ABL** point.

6-4-2 (c) WHITE BALANCE ADJUSTMENT

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Full white pattern
Brightness:	Maximum
Contrast:	Maximum

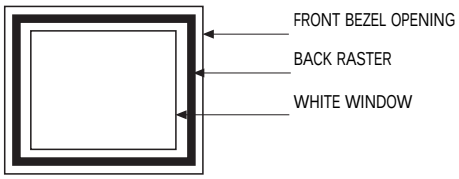


Figure 6-9. Full White Pattern

1. Click on the << or >> boxes next to **R_GAIN** and **B_GAIN** to make the video white. (For 9300K color adjustment: x = 0.283 ± 0.02, y = 0.298 ± 0.02.)

   Note: Do not touch the **G_GAIN** controls.

2. Check the ABL. If it is not within the specifications (35 ± 1 ft-L), use the ABL controls to adjust it.
3. Select **COLOR FACTORY SAVE** to save the data.

6-4-2 (d) WHITE BALANCE ADJUSTMENT VERIFICATION

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Back raster pattern
X-Y Coordinates:	x = 0.283 ± 0.02, y = 0.298 ± 0.02
ABL Luminance	35 ± 1 ft-L
Brightness:	Maximum
Contrast:	Maximum

1. Check whether the color coordinates of the back raster satisfy the above spec.

   If they do not, return to 6-4-2 (a) and readjust all settings.

2. Display a full white pattern.

Note: Do not touch the **G_GAIN** controls.

3. Adjust the Contrast Control on the monitor so that the luminance of the video is about 5 ft-L.
4. Check whether the white coordinates of the video meet the above coordinates spec.
5. Adjust the Contrast Control again so that the luminance of the video is about 24 ft-L.
6. Check whether the white coordinates of the video satisfies the above spec.

   If they do not, return to 6-4-2 (a) and readjust all settings.

6-4-3 Color Adjustments for 6500K

6-4-3 (a) BACK RASTER COLOR ADJUSTMENT

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Back raster pattern
Brightness:	Maximum
Contrast:	Maximum

1. Select **COLOR CHANNEL 2** to control the color for 6500K.
2. Adjust the luminance of the back raster to between 0.4 to 0.5 ft-L using the **G_CUT** controls.

Note: For 6500K adjustments you must not change the Screen VR of the FBT. To do so changes the 9300K setting values.

3. Click on the << or >> boxes next to **R_CUT** and **B_CUT** to adjust the R-Bias to x = 0.313 ± 0.02 and the B-Bias to y = 0.329 ± 0.02.

6-4-3 (b) G-GAIN ADJUSTMENT

This procedure is the same as that for 9300K, refer to the procedure on page 6-8.

6-4-3 (c) WHITE BALANCE ADJUSTMENT

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz
Display image:	Full white pattern
Brightness:	Maximum
Contrast:	Maximum

1. Click on the << or >> boxes next to **R_GAIN** and **B_GAIN** to make the video white. (For 6500K color adjustment: x = 0.313 ± 0.02, y = 0.329 ± 0.02.)
2. Refer to the procedure for 9300K, section 6-4-2 (c) steps 2 and 3.

6-4-3 (d) WHITE BALANCE ADJUSTMENT VERIFICATION

Refer to the procedure for 9300K, section 6-4-2 (d).

6-4-4 Luminance Uniformity Check

Luminance is considered uniform only if the ratio of lowest to highest brightness areas on the screen is not less than 7.5:10.

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz (1024 x 768)
Display image:	White flat field
Brightness:	Cut off point at 24 ft-L
Contrast:	Maximum

PROCEDURE

Measure luminance at nine points on the display screen (see figure below).

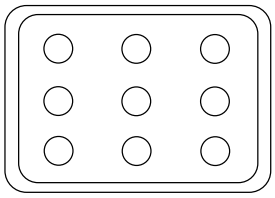


Figure 6-10. Luminance Uniformity Check Locations

6-4-5 Focus Adjustment

CONDITIONS

Scanning frequency:	60 kHz / 75 Hz (1024 x 768)
Display image:	"H" character pattern
Brightness:	Cut off point
Contrast:	Maximum

PROCEDURE

1. Adjust the Focus VR on the FBT to display the sharpest image possible.
2. Use Locktite to seal the Focus VR in position.

6-4-6 Color Purity Adjustment

Color purity is the absence of undesired color. Conspicuous mislanding (unexpected color in a uniform field) within the display area shall not be visible at a distance of 50 cm from the CRT surface.

CONDITIONS

Orientation:	Monitor facing east
Scanning frequency:	60 kHz / 75 Hz
Display image:	White flat field
Luminance:	Cut off point at the center of the display area

Note: Color purity adjustments should only be attempted by qualified personnel.

PROCEDURE

For trained and experienced service technicians only.

Use the following procedure to correct minor color purity problems:

1. Make sure the display is not affected by external magnetic fields.
2. Very carefully break the glue seal between the 2-pole purity convergence magnets (PCM), the band and the spacer (see Figures 6-11).
3. Make sure the spacing between the PCM assembly and the CRT stem is 29 mm ± 1 mm.
4. Display a green pattern over the entire display area.
5. Adjust the purity magnet rings on the PCM assembly to display a pure green pattern. (Optimum setting: x = 0.295 ± 0.015, y = 0.594 ± 0.015)
6. Repeat steps 4 and 5 using a red pattern and then again, using a blue pattern.

Table 6-3. Color Purity Tolerances

Red:	x = 0.640 ± 0.015	y = 0.323 ± 0.015
Green:	x = 0.295 ± 0.015	y = 0.594 ± 0.015
Blue:	x = 0.142 ± 0.015	y = 0.066 ± 0.015

(For 9300K color adjustment: x = 0.283 ± 0.02, y = 0.298 ± 0.02)

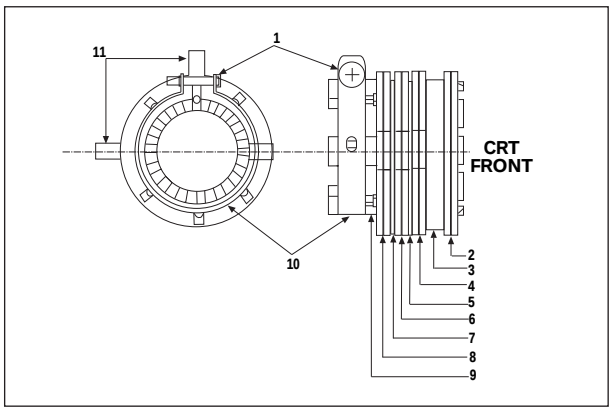
7. When you have the PCMs properly adjusted, carefully glue them together to prevent their movement during shipping.

6-5 Convergence Adjustments

Misconvergence occurs when one or more of the electron beams in a multibeam CRT fail to meet the other beams at a specified point.

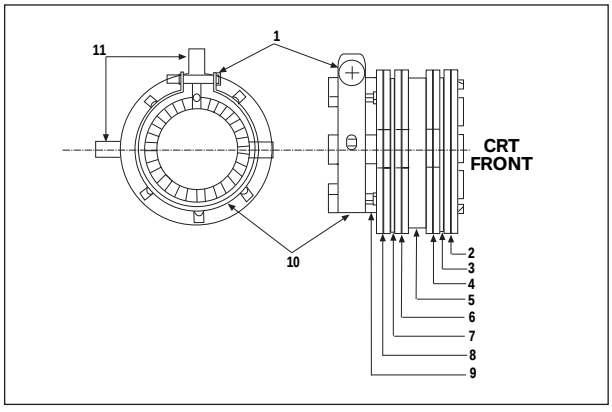
Table 6-4. Misconvergence Tolerances

Position	Error in mm	CRT Dot Pitch
Center (A)	0.30	0.28
Edge (B)	0.40	0.28



Samsung SDD CRT			
1 Setup Bolt	2 Bow Magnet	3 Band	4 2-Pole Magnet
5 Spacer	6 4-Pole Magnet	7 Spacer	8 6-Pole Magnet
9 Holder	10 Band	11 Tabs	

Figure 6-11. Magnet Configuration



Toshiba CRT			
1 Setup Bolt	2 Bow Magnet	3 Spacer	4 2-Pole Magnet
5 Band	6 6-Pole Magnet	7 Spacer	8 4-Pole Magnet
9 Holder	10 Band	11 Tabs	

Figure 6-12. Toshiba Magnet Configuration

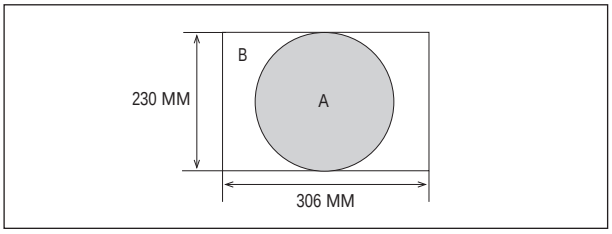


Figure 6-13. Convergence Measurement Areas

6-5-1 Static (Center) Convergence

Static convergence involves alignment of the red, blue and green lines in the center area of the display. See “Dynamic Convergence” for alignment of the color fields around the edges of the display.

CONDITIONS

Direction: Monitor facing east
Warm-up: 30 minutes
Display image: Crosshatch pattern
Tolerances: See Table 6-4

PROCEDURE

As shown in Figure 6-11, the CRT used in these monitors has the same magnet configuration as shown in Table 6-5 below.

Table 6-5. Magnet Order

CRT Manufacturer	Magnet Order from Front of CRT
SDD	Convergence bow, 2-pole, 4-pole, 6-pole
Toshiba	Convergence bow, 2-pole, 6-pole, 4-pole

Use the following steps to correct any static misconvergence:

1. Make sure the display is not affected by external magnetic fields.
2. Locate the pair of 4-pole magnet rings.
3. Unlock the rings and rotate the individual rings (change the spacing between tabs) to converge the vertical red and blue lines.
4. Rotate the pair of rings (maintaining the spacing between tabs) to converge the horizontal red and blue lines.

5. After completing the red and blue center convergence adjustment, locate the pair of 6-pole magnet rings.
6. Rotate the individual rings (change the spacing between tabs) to converge the vertical red and blue (magenta) and green lines.
7. Rotate the pair of rings (maintaining the spacing between tabs) to converge the horizontal red and blue (magenta) and green lines. Don't rotate the 2-pole magnets as they adjust for color purity.
8. Mark the correct position for the magnets and apply a small line of glue to hold the magnets in place. Lock the rings in place.

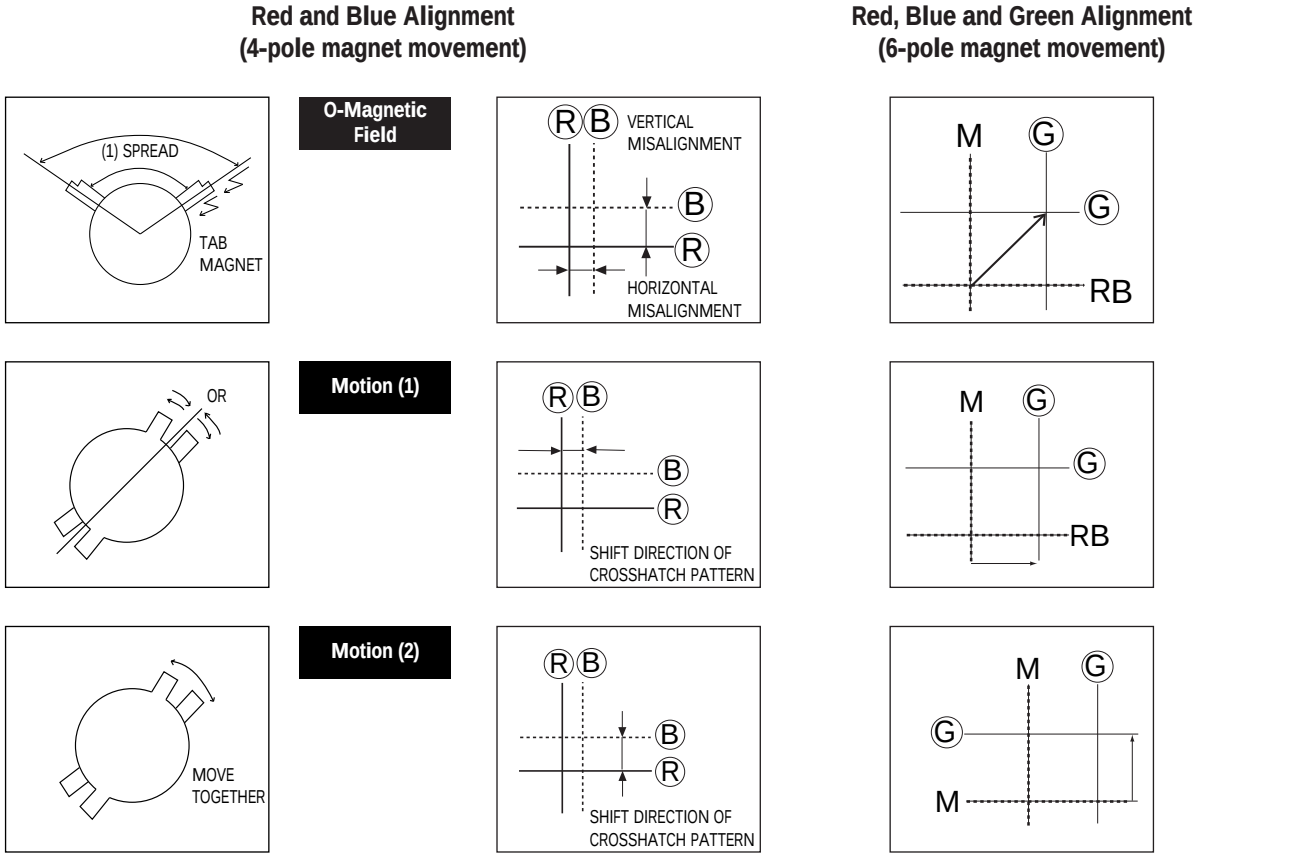
6-5-2 Dynamic (Edge) Convergence

Use the following procedure to correct minor dynamic (edge) misconvergence. If, after using this procedure, dynamic misconvergence around the periphery of the display area is still greater than the tolerance, contact the Regional After Service Center for possible CRT replacement.

1. Make sure the display is not affected by external magnetic fields.
2. Make sure the static convergence is properly adjusted.
3. Strategically place small rubber magnets on the back of the CRT to correct the misconvergence. Be careful not to remove the paper protecting the adhesive on the magnets until you are satisfied with their placement and the dynamic convergence.
4. When you are satisfied with the convergence around the edge of the CRT, permanently glue the magnets to the back of the CRT.

WARNING: Do not remove or change the position of the factory installed wedges. These wedges were installed by the CRT manufacturer and are properly placed for this CRT; their removal may result in damage to the CRT.

Figure 6-14. Magnet Movements



6-5-3 Bow Convergence Adjustments

CONDITIONS

Orientation: Monitor facing east.
Display Image: Crosshatch pattern with mixed RGB colors.
Required tools: Flat-head (–) screwdriver, 1.5 mm
Philips (+) screwdriver, 1.5 mm
Hexkey, 2.5 mm

PROCEDURE

Bow convergence adjustments are not available for the CRTs used in the CKG7507L monitor. While all CRTs have bow convergence magnets, they are sealed in the CRT factory and are not user or service technician adjustable. Do not touch these magnets (see Figures 6-11 and 6-12). If bow convergence adjustment is out of alignment, replace the CRT.

Bow misconvergence should not exceed the values listed in Table 6-5: Misconvergence Tolerances.

6-5-4 Balance Convergence Adjustments

Balance Convergence involves alignment of red and blue lines when they are misaligned at one end more so than at the other end. The Deflection Yoke holds the balance coils which can correct balance misconvergences.

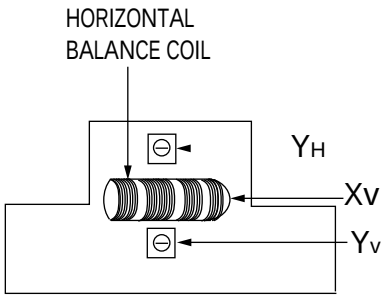


Figure 6-15. SDD Deflection Yoke

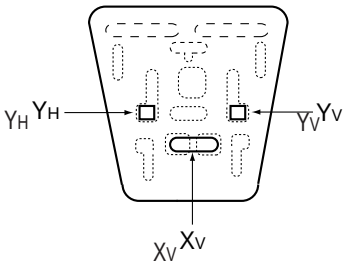


Figure 6-16. Toshiba Deflection Yoke

6-5-4 (a) HORIZONTAL LINE RED AND BLUE BALANCE CONVERGENCE

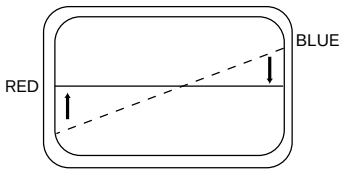


Figure 6-17. Horizontal Line Balance Misconvergence

Use a 2.5 mm hexkey at the Horizontal Balance Coil (XV). Turning it right raises the right end of the blue line and lowers the left end. Turning the VR to the left lowers the right end of the blue line and raises the left end.

6-5-4 (b) VERTICAL RED AND BLUE BALANCE CONVERGENCE

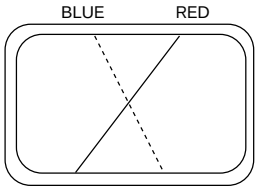


Figure 6-18. Vertical Line Balance Misconvergence

Use a 1.5 mm screwdriver (flat-head [–] for SDD DYs and phillips type [+] for Toshiba DYs) at the YH variable register. Turning the VR left tilts the blue line to the right. Turning it right tilts the blue line to the left.

6-5-4 (c) UPPER AND LOWER HORIZONTAL LINE CONVERGENCE

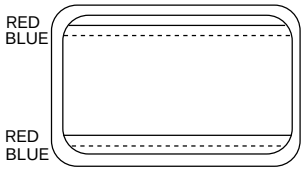


Figure 6-19. Upper and Lower Balance Misconvergence

Use a 1.5 mm screwdriver (flat-head [–] for SDD DYs and phillips type [+] for Toshiba DYs) at the Yv variable register. Turning the VR to the left moves the blue line at the top upward and at the bottom, the line moves downward. Turning it right moves the blue line at the top downward and at the bottom, the line moves upward.

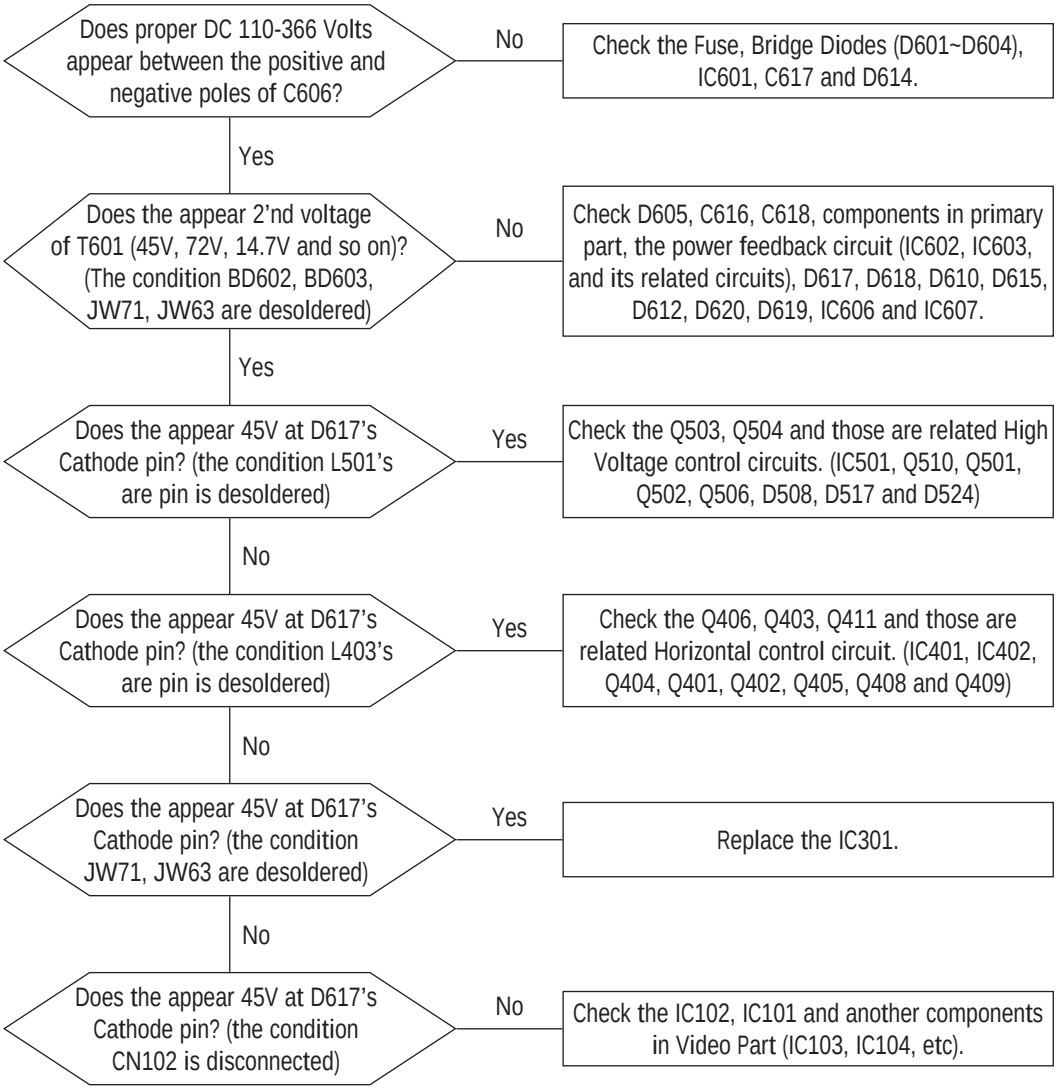
Memo

7 Troubleshooting

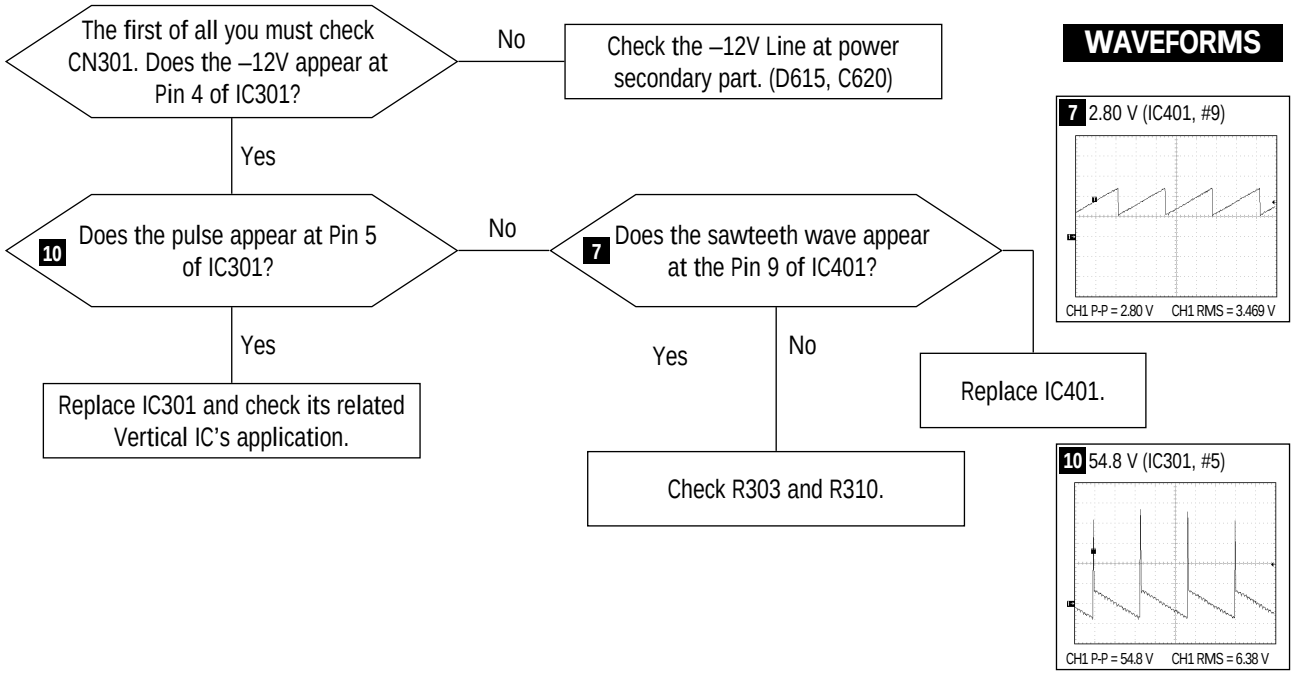
Notes: 1. If a picture does not appear, fully rotate the brightness and contrast controls clockwise and reinspect.

2. Check the following circuits.
   - No raster appears: Power circuit,Horizontal output circuit, H/V control circuit, and H/V output circuit.
   - High voltage develops but no raster appears: Video output circuits.
   - High voltage does not develop: Horizontal output circuits.

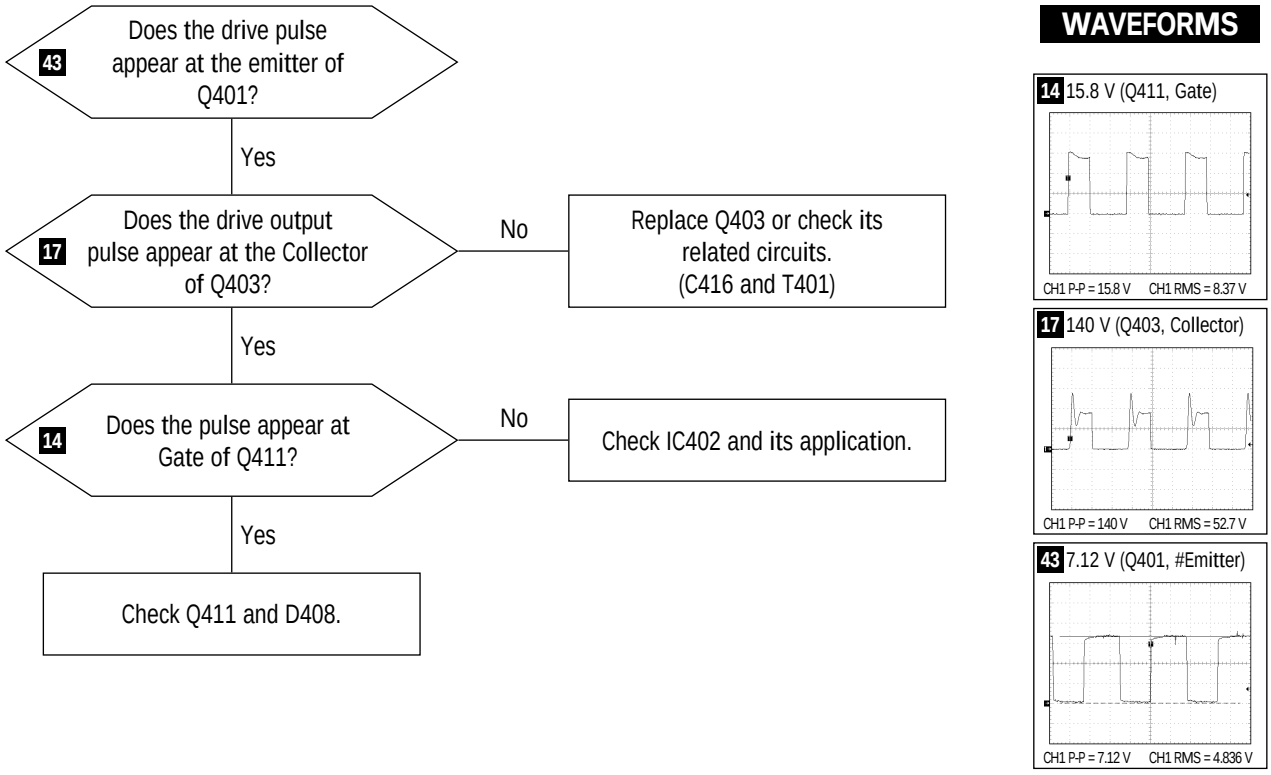
7-1 No Power


Does proper DC 110-366 Volts appear between the positive and negative poles of C606?
No
Check the Fuse, Bridge Diodes (D601~D604), IC601, C617 and D614.
Yes
Does the appear 2'nd voltage of T601 (45V, 72V, 14.7V and so on)? (The condition BD602, BD603, JW71, JW63 are desoldered)
No
Check D605, C616, C618, components in primary part, the power feedback circuit (IC602, IC603, and its related circuits), D617, D618, D610, D615, D612, D620, D619, IC606 and IC607.
Yes
Does the appear 45V at D617's Cathode pin? (the condition L501's are pin is desoldered)
Yes
Check the Q503, Q504 and those are related High Voltage control circuits. (IC501, Q510, Q501, Q502, Q506, D508, D517 and D524)
No
Does the appear 45V at D617's Cathode pin? (the condition L403's are pin is desoldered)
Yes
Check the Q406, Q403, Q411 and those are related Horizontal control circuit. (IC401, IC402, Q404, Q401, Q402, Q405, Q408 and Q409)
No
Does the appear 45V at D617's Cathode pin? (the condition JW71, JW63 are desoldered)
Yes
Replace the IC301.
No
Does the appear 45V at D617's Cathode pin? (the condition CN102 is disconnected)
No
Check the IC102, IC101 and another components in Video Part (IC103, IC104, etc).

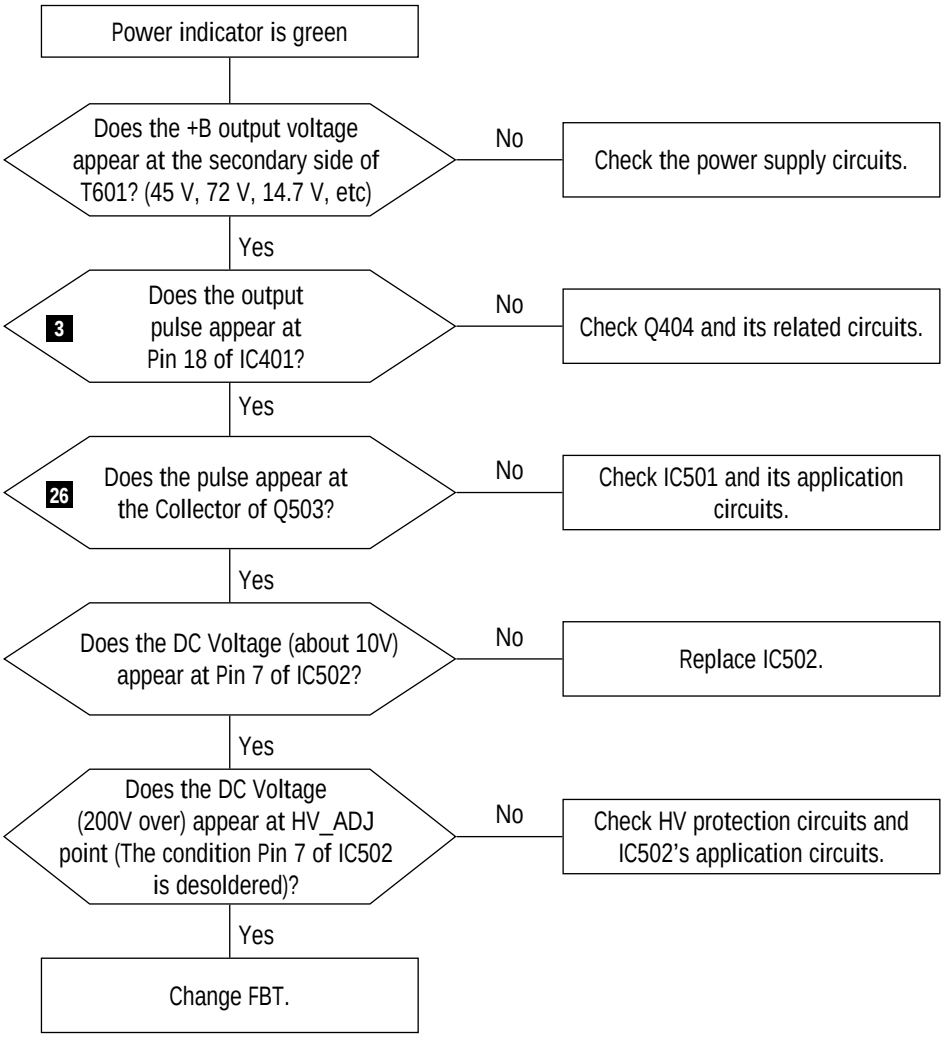
7-2 Horizontal Line on CRT or Rainbow Color on the Screen


The first of all you must check CN301. Does the –12V appear at Pin 4 of IC301?
No
Check the –12V Line at power secondary part. (D615, C620)
Yes
10 Does the pulse appear at Pin 5 of IC301?
No
7 Does the sawteeth wave appear at the Pin 9 of IC401?
Yes
Replace IC301 and check its related Vertical IC's application.
Yes
No
Replace IC401.
Check R303 and R310.
WAVEFORMS
7 2.80 V (IC401, #9)
CH1 P-P = 2.80 V CH1 RMS = 3.469 V
10 54.8 V (IC301, #5)
CH1 P-P = 54.8 V CH1 RMS = 6.38 V

7-3 Vertical Line on CRT

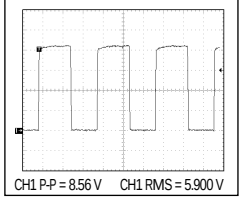

43 Does the drive pulse appear at the emitter of Q401?
Yes
17 Does the drive output pulse appear at the Collector of Q403?
No
Replace Q403 or check its related circuits. (C416 and T401)
Yes
14 Does the pulse appear at Gate of Q411?
No
Check IC402 and its application.
Yes
Check Q411 and D408.
WAVEFORMS
14 15.8 V (Q411, Gate)
CH1 P-P = 15.8 V CH1 RMS = 8.37 V
17 140 V (Q403, Collector)
CH1 P-P = 140 V CH1 RMS = 52.7 V
43 7.12 V (Q401, #Emitter)
CH1 P-P = 7.12 V CH1 RMS = 4.836 V

7-4 No Raster (1)

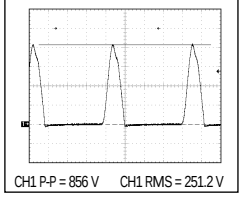

Power indicator is green
Does the +B output voltage appear at the secondary side of T601? (45 V, 72 V, 14.7 V, etc)
No
Check the power supply circuits.
Yes
3
Does the output pulse appear at Pin 18 of IC401?
No
Check Q404 and its related circuits.
Yes
26
Does the pulse appear at the Collector of Q503?
No
Check IC501 and its application circuits.
Yes
Does the DC Voltage (about 10V) appear at Pin 7 of IC502?
No
Replace IC502.
Yes
Does the DC Voltage (200V over) appear at HV_ADJ point (The condition Pin 7 of IC502 is desoldered)?
No
Check HV protection circuits and IC502's application circuits.
Yes
Change FBT.

WAVEFORMS

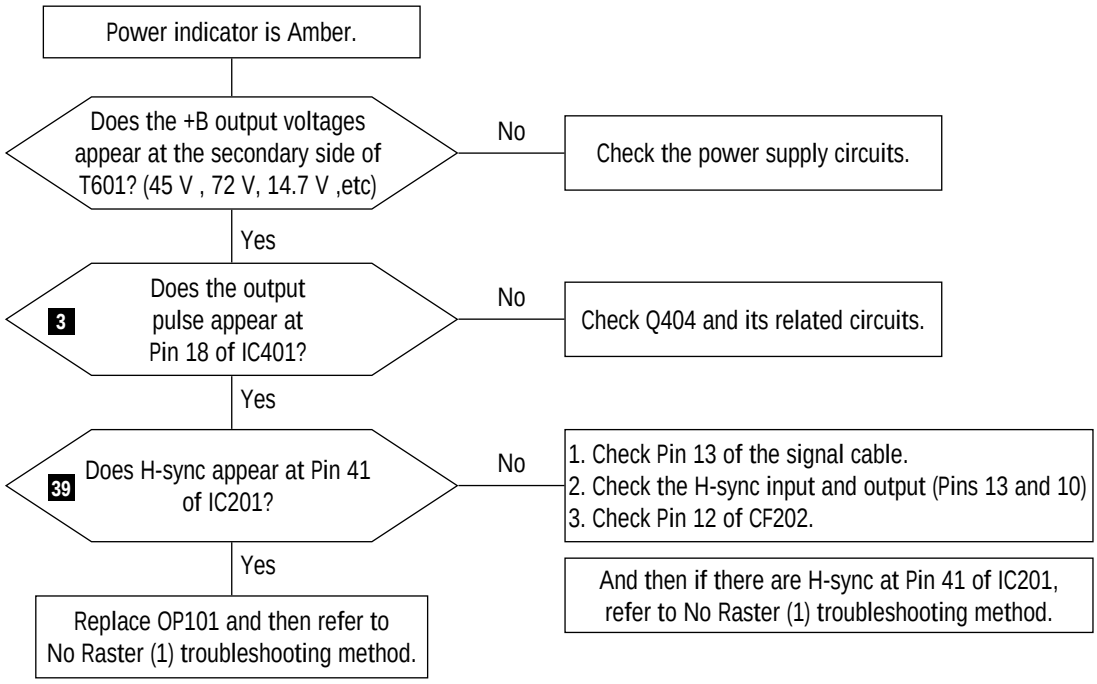
3 8.56 V (IC401, #18)



26 856 V (Q503, Collector)

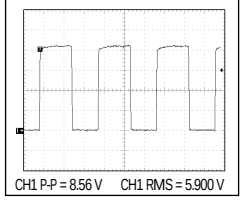


7-5 No Raster (2)

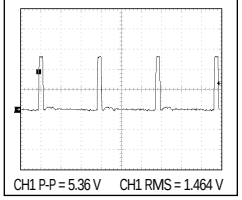

Power indicator is Amber.
Does the +B output voltages appear at the secondary side of T601? (45 V , 72 V, 14.7 V ,etc)
No
Check the power supply circuits.
Yes
3
Does the output pulse appear at Pin 18 of IC401?
No
Check Q404 and its related circuits.
Yes
39
Does H-sync appear at Pin 41 of IC201?
No
1. Check Pin 13 of the signal cable.
2. Check the H-sync input and output (Pins 13 and 10)
3. Check Pin 12 of CF202.
Yes
Replace OP101 and then refer to No Raster (1) troubleshooting method.
And then if there are H-sync at Pin 41 of IC201, refer to No Raster (1) troubleshooting method.

WAVEFORMS

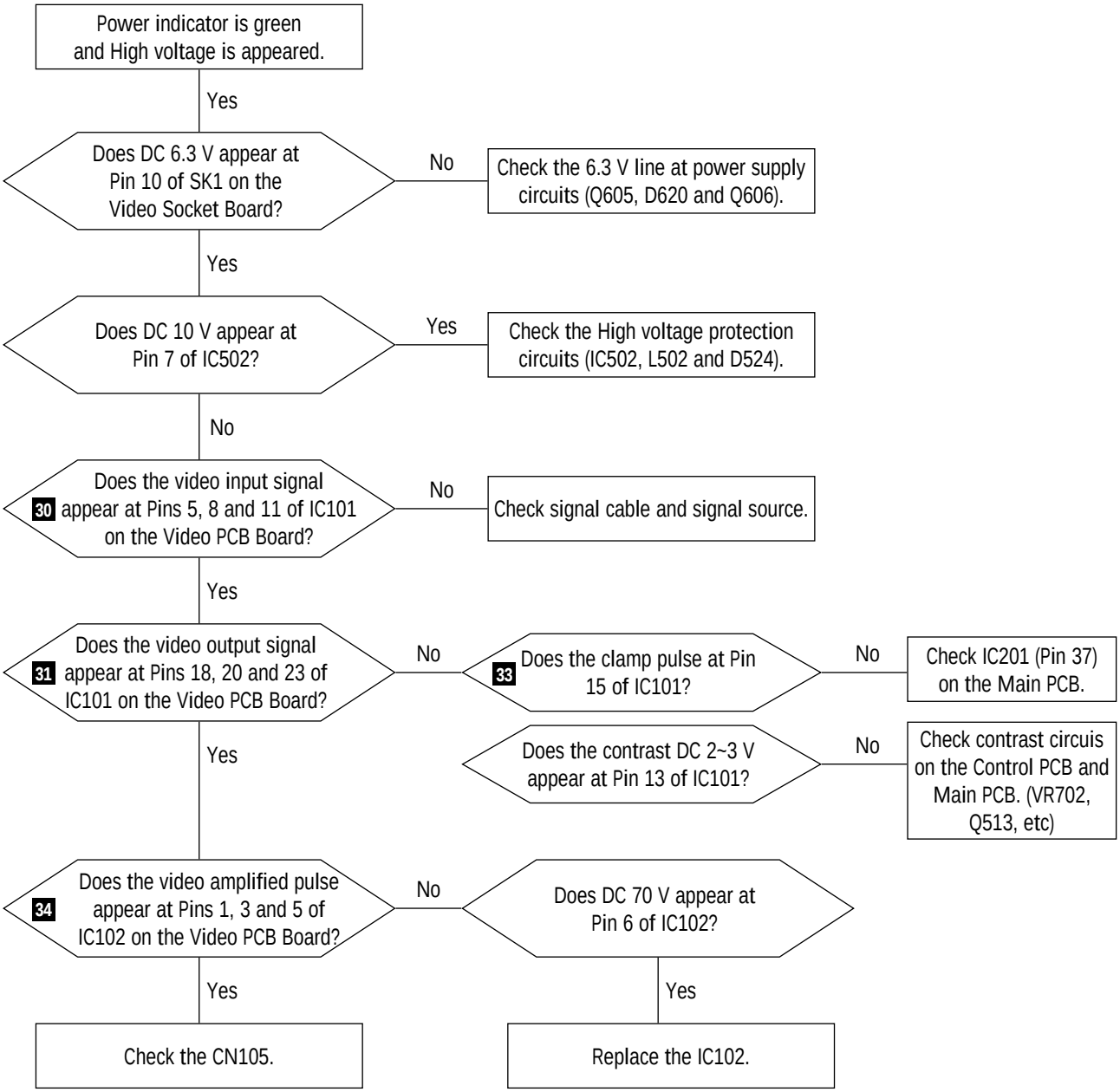
3 8.56 V (IC401, #18)



39 5.36 V (IC201, #41)

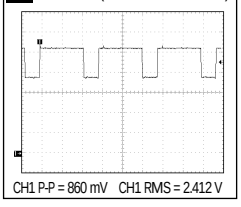


7-6 No Video

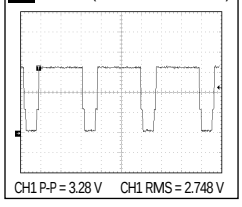

Power indicator is green and High voltage is appeared.
Yes
Does DC 6.3 V appear at Pin 10 of SK1 on the Video Socket Board?
No
Check the 6.3 V line at power supply circuits (Q605, D620 and Q606).
Yes
Does DC 10 V appear at Pin 7 of IC502?
Yes
Check the High voltage protection circuits (IC502, L502 and D524).
No
30 Does the video input signal appear at Pins 5, 8 and 11 of IC101 on the Video PCB Board?
No
Check signal cable and signal source.
Yes
31 Does the video output signal appear at Pins 18, 20 and 23 of IC101 on the Video PCB Board?
No
33 Does the clamp pulse at Pin 15 of IC101?
No
Check IC201 (Pin 37) on the Main PCB.
Does the contrast DC 2~3 V appear at Pin 13 of IC101?
No
Check contrast circuis on the Control PCB and Main PCB. (VR702, Q513, etc)
Yes
34 Does the video amplified pulse appear at Pins 1, 3 and 5 of IC102 on the Video PCB Board?
No
Does DC 70 V appear at Pin 6 of IC102?
Yes
Yes
Check the CN105.
Replace the IC102.

WAVEFORMS

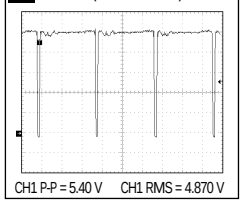
30 860 mV (IC101, #5, 8, 11)



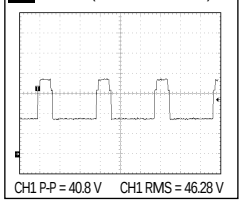
31 3.28 V (IC101, #18,20,23)



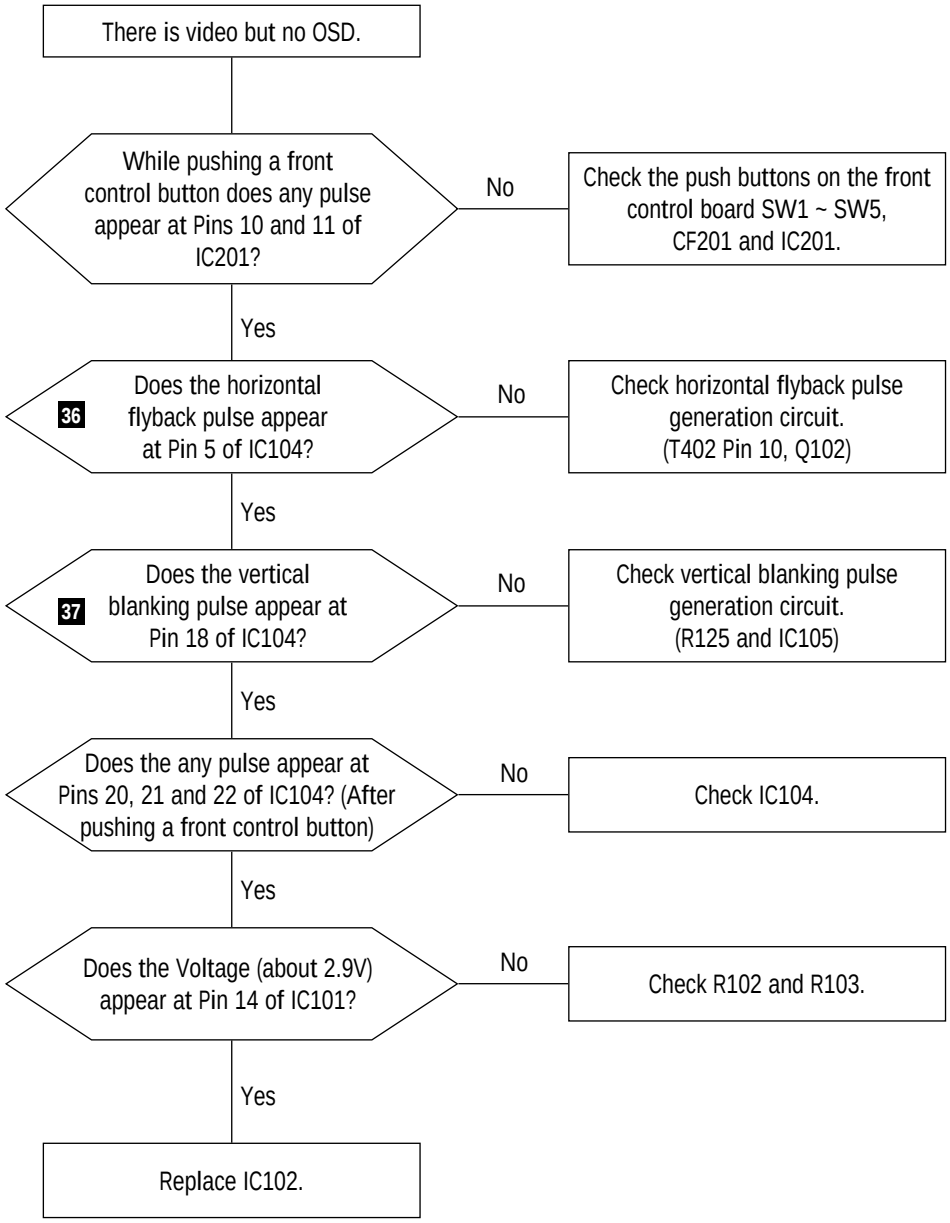
33 5.40 V (IC101, #15)



34 40.8 V (IC102, #1, 3, 5)

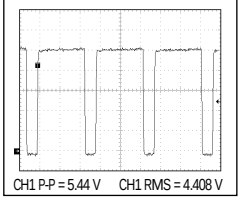


7-7 No OSD Displays

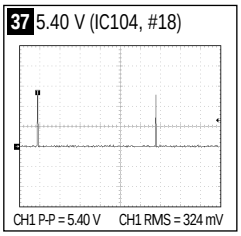

There is video but no OSD.
While pushing a front control button does any pulse appear at Pins 10 and 11 of IC201?
No
Check the push buttons on the front control board SW1 ~ SW5, CF201 and IC201.
Yes
36
Does the horizontal flyback pulse appear at Pin 5 of IC104?
No
Check horizontal flyback pulse generation circuit. (T402 Pin 10, Q102)
Yes
37
Does the vertical blanking pulse appear at Pin 18 of IC104?
No
Check vertical blanking pulse generation circuit. (R125 and IC105)
Yes
Does the any pulse appear at Pins 20, 21 and 22 of IC104? (After pushing a front control button)
No
Check IC104.
Yes
Does the Voltage (about 2.9V) appear at Pin 14 of IC101?
No
Check R102 and R103.
Yes
Replace IC102.

WAVEFORMS

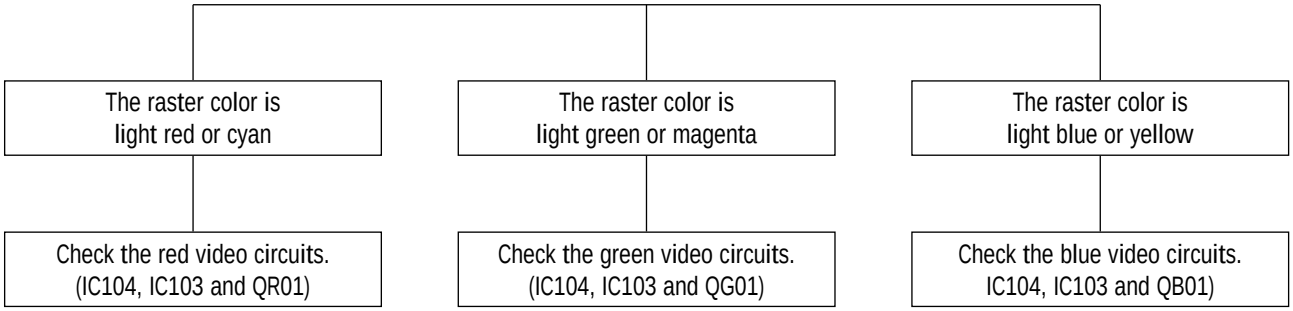
36 5.44 V (IC104, #5)



37 5.40 V (IC104, #18)

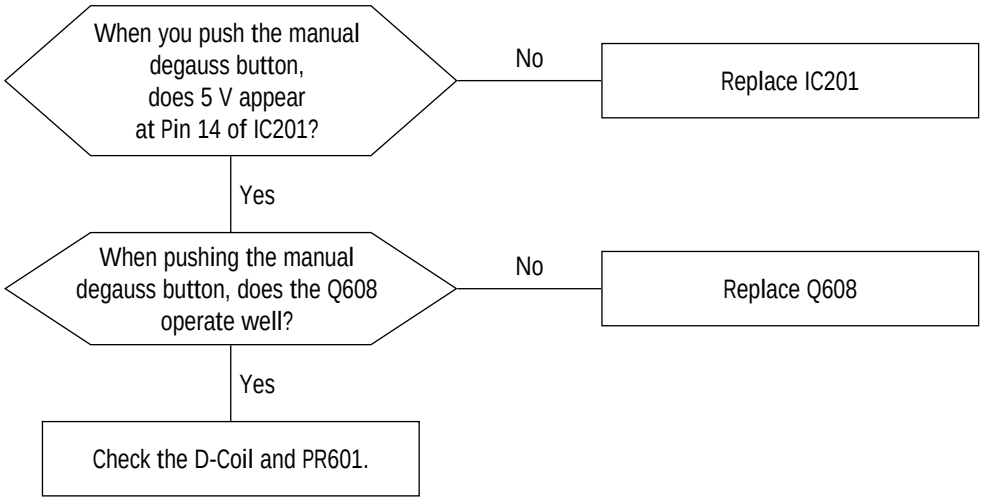


7-8 No Specific Color Appears


The raster color is light red or cyan
The raster color is light green or magenta
The raster color is light blue or yellow
Check the red video circuits. (IC104, IC103 and QR01)
Check the green video circuits. (IC104, IC103 and QG01)
Check the blue video circuits. IC104, IC103 and QB01)

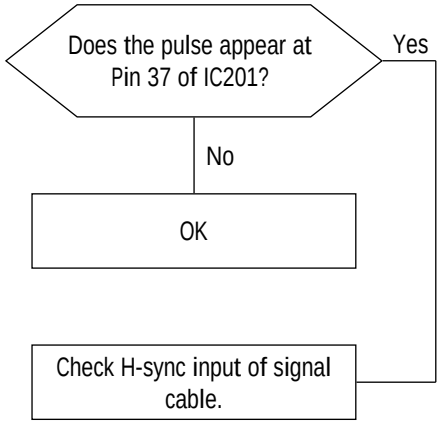
Note: Removing the signal cable displays a self raster screen. This screen displays the message "check signal cable" along with red, green and blue boxes. Use these boxes to check whether each individual color (R, G, B) is operating or not.

7-9 Degauss Operation Failure

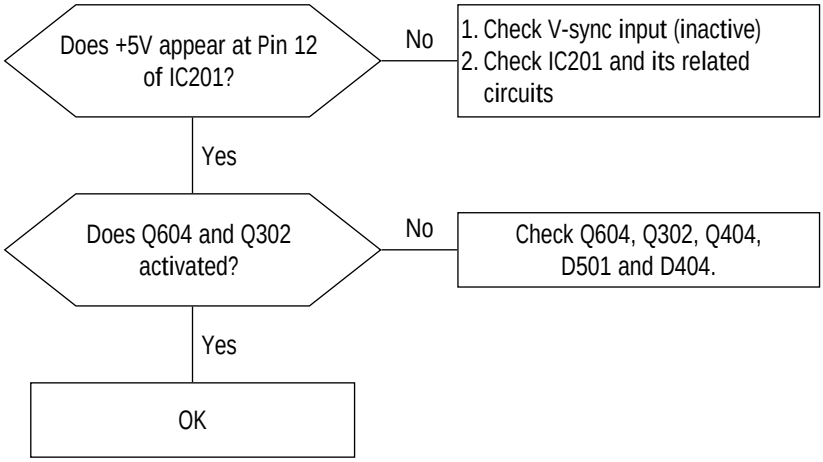

When you push the manual degauss button, does 5 V appear at Pin 14 of IC201?
No
Replace IC201
Yes
When pushing the manual degauss button, does the Q608 operate well?
No
Replace Q608
Yes
Check the D-Coil and PR601.

7-10 Power Save Management System Failure

7-10-1 Stand-By Mode



7-10-2 Suspend Mode



7-10-3 Off Mode

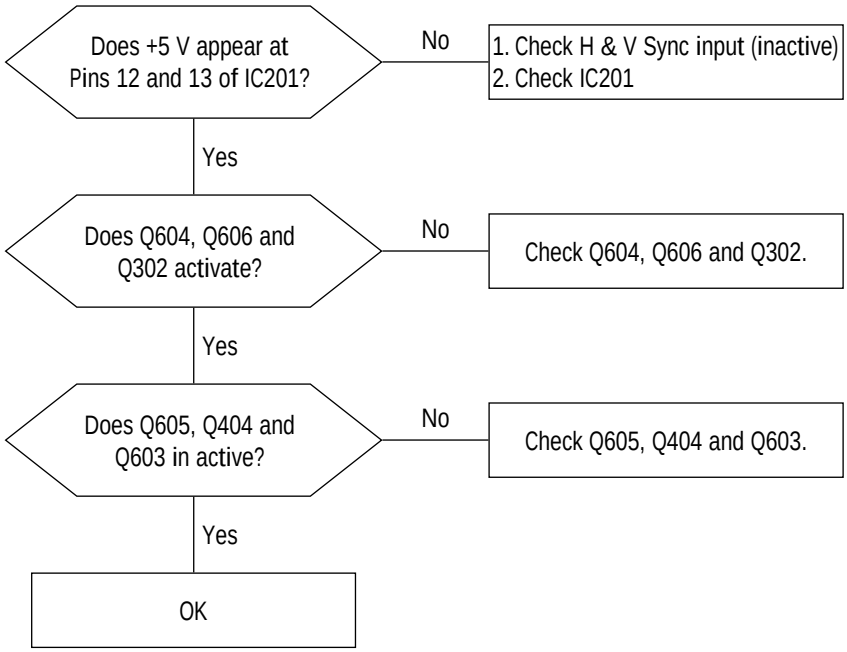


Table 7-1. DPMS Logic Table

Mode	Sync		Video	LED Color
	H	V		
Normal	Active	Active	Active	Green
Stand-By	Inactive	Active	Blank	Amber
Suspend	Active	Inactive	Blank	Amber/Green blinking
Off	Inactive	Inactive	Blank	Amber blinking

Note: If the signal cable is removed, DPMS function does not operate and a self raster displays.

7-11 User Controls Don't Work

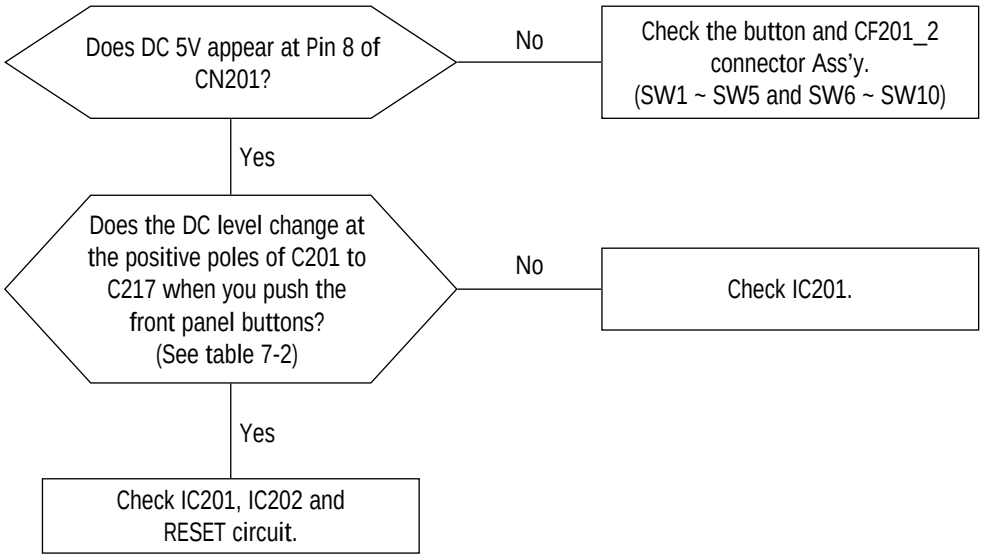

Does DC 5V appear at Pin 8 of CN201?
No
Check the button and CF201_2 connector Ass'y. (SW1 ~ SW5 and SW6 ~ SW10)
Yes
Does the DC level change at the positive poles of C201 to C217 when you push the front panel buttons? (See table 7-2)
No
Check IC201.
Yes
Check IC201, IC202 and RESET circuit.

Table 7-2. Front Panel Button

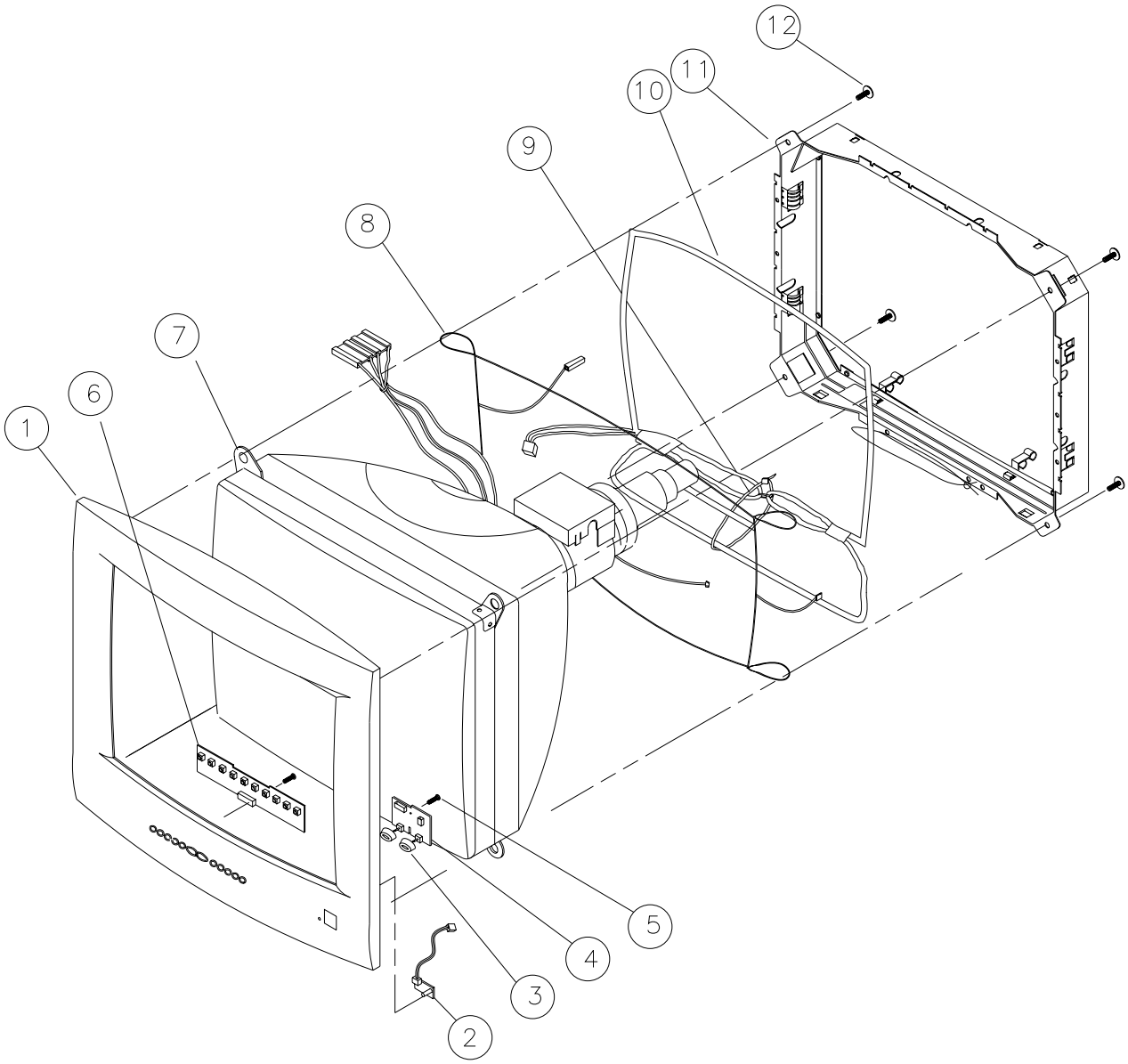
Location	Function
C201	Horizontal Size
C202	Vertical Position
C203	Horizontal Position
C211	Vertical Linearity
C212	Pinbalance
C213	Parallelogram
C214	Trapezoid
C216	Side Pincushion
C217	Vertical Size

Memo

8 Exploded View and Parts List

8-1 Front Cover & CRT Ass'y

NO	DESCRIPTION	CODE NO	SPECIFICATION	Q'TY	REMARK
1	UNIT-C/FRONT	BH75-10508Q	CKG7507LXX	1	NON MULTI-MEDIA
		BH75-10508R	CKG7507LMX	1	MULTI-MEDIA
		BH75-10508S	CKG7507TXX	1	NON MULTI-MEDIA,TCO
		BH75-10508T	CKG7507TMX	1	MULTI-MEDIA,TCO
2	ASS'Y-LED PCB		CKG7507	1	
3	KNOB-VR	BH64-10392A	ABS HB IV16	2	
4	ASS°Y-VR PCB		CKG7507	1	
5	SCREW TAPTITE	6003-000015	BH,D3,L8	1	
6	ASS°Y-FUNTION PCB		CKG7507	1	
7	CRT-COLOR	BH03-10335B	17",0.28	1	
8	ASS°Y-CDT GROWND		CKG7507	1	
9	CABLE-TIE	BH65-10100A	NYLON66,L150	2	
10	ASS°Y-D COIL		CKG7507	1	
11	UNIT/BRKT	BH75-10422L	CKG7507	1	
12	SCREW-ASS'Y TAPT	6006-001010	WPP,BH,D5,L25	4	



9 Electrical Parts List

9-1 Main PCB Parts

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
BD404	199.3	138.9	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD501	138.3	147.9	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD601	81.2	134	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD602	109.2	151	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD603	92.1	146.5	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD604	33.1	105	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
C201	95.9	310.1	2401-000913	C-AL	22uF,20%,16V,GP,5x11mm,2mm,TP	
C202	97.4	275.6	2401-000027	(T)50V 4.7M	CAP-AL.ELEC,475M,1H	
C203	64.7	312.3	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C204	18.5	287.5	2201-000010	C-CERAMIC,DISC	33pF,5%,50V,NPO,5x3.5,5,TP	
C205	57.5	246.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C206	18.5	283	2201-000010	C-CERAMIC,DISC	33pF,5%,50V,NPO,5x3.5,5,TP	
C207	62.8	300.5	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C208	61.2	304.1	2201-000471	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C209	118.6	240.6	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C211	111.3	265.7	2401-000027	(T)50V 4.7M	CAP-AL.ELEC,475M,1H	
C212	98.7	294.5	2401-000027	(T)50V 4.7M	CAP-AL.ELEC,475M,1H	
C213	97.1	289.9	2401-000027	(T)50V 4.7M	CAP-AL.ELEC,475M,1H	
C214	94.6	297.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C216	105.7	297.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C217	110.7	277.9	2401-000027	(T)50V 4.7M	CAP-AL.ELEC,475M,1H	
C221	23.7	295.2	2401-000037	CAP-AL.ELEC,477M,1C	(T)470UF,16V,20%,8x11.5,R-RADIAL	
C222	29.8	312.2	2401-000027	(T)50V 4.7M	CAP-AL.ELEC,475M,1H	
C299	117.8	304.7	2401-001334	C-AL	470nF,20%,50V,GP,5x11mm,2mm,TP	
C300	144.6	301.4	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C301	116.8	289.1	2306-000006	C-FILM,MPPF	330nF,5%,250V,20x18.5x10.5,7.5	
C302	118.3	281.3	2401-000913	C-AL	22uF,20%,16V,GP,5x11mm,2mm,TP	
C304	67.4	215.4	2301-000013	C-FILM,PEF	4.7NF,5%,100V,10.5x12.5x6.5mm, 5mm	
C305	123	262.6	2401-000053	(T)25V 10M	CAP-AL.ELEC,106M,1E	
C306	35.2	217.9	2401-000849	(T)35V 220M	CAP-AL.ELEC,227M,1V	
C308	28.1	211.5	2305-000280	C-FILM,PEF	220NF, 10%, 63V,7.5X13.5mm,5mm,T	
C311	22.4	218.6	2401-000038	C-AL	470uF,20%,25V,GP,10x12.5mm,5mm	
C314	116.1	238.8	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C315	116.1	236	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C316	63.8	229.7	2301-000022	C-FILM,PEF	100nF,10%,200V,11.0X14.0X7.0,7	
C318	35.5	224.7	2401-000027	(T)50V 4.7M	CAP-AL.ELEC,475M,1H	
C400	148.2	317.7	2201-000017	CAP-CERAMIC,102K,1H,Y5P	1NF,50V,10%,10%,Y5P,DISC-RADIAL	
C401	137.9	295.3	2401-001016	(T)50V 3.3M	CAP-AL.NP-ELEC,335M,1H,6X11	
C402	148.7	297.3	2401-000023	C-AL	1uF,20%,50V,GP,5x11mm,5mm,TP	
C403	137.8	288.5	2201-000017	CAP-CERAMIC,102K,1H,Y5P	1NF,50V,10%,10%,Y5P,DISC-RADIAL	
C404	146.8	290.7	2305-000280	C-FILM,PEF	220NF, 10%, 63V,7.5X13.5mm,5mm,T	
C405	142.7	284.8	2201-000472	C-CERAMIC,DISC	330pF,5%,50V,SL,8x3.5,5,TP	
C407	143.7	281.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C408	138.6	278	2401-000023	C-AL	1uF,20%,50V,GP,5x11mm,5mm,TP	
C409	138.6	271	2401-001334	C-AL	470nF,20%,50V,GP,5x11mm,2mm,TP	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
C411	131.1	228.9	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C413	149.3	192.2	2301-000016	(T)100V 223J	CAP-MYLAR,223J,2A,5P	
C414	149.6	169.2	2301-000010	C-FILM,PEF	100nF,5%,100V,11.5x12.5mm,5mm	
C415	115.6	232.1	2401-000026	(T)50V 3.3M	CAP-AL.ELEC,335M,1H	
C416	160.8	187.1	2201-000291	CAP-CERAMIC,102K,2H,Y5P	1NF,500V,20%,10%,Y5P,DISC-RADIA	
C417	165.6	154.8	2305-000231	(T)63V 105K	CAP-MPETP,105K,1J,5P	⚠
C418	190.8	158.9	2303-001023	C-FILM,PPF	2.2nF,5%,2.5KV,23x13x19,7.5mm	⚠
C419	207.6	158.9	2303-001023	C-FILM,PPF	2.2nF,5%,2.5KV,23x13x19,7.5mm	⚠
C421	220.5	242.3	2306-000137	180NF,250V 5%,RE-RADIAL	CAP-MPPF,184J,2E,7.5P	
C422	216.4	197.7	2306-000171	(T)250V 274J	CAP-MPPF,274J,2E,7.5P	
C424	228.7	186.7	2201-000291	CAP-CERAMIC,102K,2H,Y5P	1NF,500V,20%,10%,Y5P,DISC-RADIA	
C426	230.8	165.1	2201-000291	CAP-CERAMIC,102K,2H,Y5P	1NF,500V,20%,10%,Y5P,DISC-RADIA	
C427	220.1	208.9	2401-000038	C-AL	470uF,20%,25V,GP,10x12.5mm,5mm	
C430	220.5	251.6	2306-000119	250V 104J	CAP-MPPF,104J,2G,12.5P	
C431	218	266.9	2306-000179	C-FILM,MPPF	300nF,5%,250V,21.5x13.5mm,7.5m	
C432	211.5	279.2	2306-000007	250V 474J	CAP-MPPF,474J,2E	
C433	229.3	197.1	2306-000125	C-FILM,MPPF	120nF,5%,250V,19x15x7mm,7.5mm	
C434	229.3	206.7	2306-000131	C-FILM,MPPF	150nF,5%,250V,21.5x11mm,7.5mm	
C436	162.7	249.1	2301-000021	C-FILM,PEF	68nF,5%,100V,10x12.5mm,5mm,TP	
C437	172.9	194.5	2306-000171	(T)250V 274J	CAP-MPPF,274J,2E,7.5P	
C438	188.8	223.2	2201-000469	C-CERAMIC,DISC	330pF,10%,500V,Y5P,6x3.5,5,TP	
C440	173.8	209.4	2401-000374	(T)100UF,63V,20%,R-RADIAL	CAP-AL.ELEC,107M,1J,105C,10x12.5	
C441	179.7	259.7	2301-000203	C-FILM,PEF	2.7nF,5%,100V,7x3.0x6.5mm,5mm	
C443	148.8	253.1	2401-001016	(T)50V 3.3M	CAP-AL.NP-ELEC,335M,1H,6X11	
C444	173.9	283.1	2305-000280	C-FILM,PEF	220NF, 10%, 63V,7.5X13.5mm,5mm,T	
C445	170.7	278.2	2201-000144	C-CERAMIC,DISC	100pF,5%,50V,NPO,8.0X4.0,5,TP	
C448	178.9	243.7	2201-000232	C-CERAMIC,DISC	150pF,10%,50V,Y5P,4x3.5,5,TP	
C449	184.7	266.5	2301-000184	C-FILM,PEF	1nF,10%,100V,5.3x10mm,5mm,TP	
C451	190	279.4	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C452	190.5	275.9	2401-000030	(T)25V 22M	CAP-AL.ELEC,226M,1E	
C453	179.4	291.1	2401-000026	(T)50V 3.3M	CAP-AL.ELEC,335M,1H	
C454	133.4	258.2	2401-000037	(T)470UF,16V,20%,R-RADIAL	CAP-AL.ELEC,477M,1C,8x11.5	
C460	152.1	285	2401-000023	C-AL	1uF,20%,50V,GP,5x11mm,5mm,TP	
C501	116.2	183.4	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C502	116.9	65.2	2401-000025	C-AL	100uF,20%,16V,GP,8x11.5mm,3.5m	
C503	131.6	77.6	2401-000054	C-AL	100uF,20%,50V,WT,10x16mm,5mm,T	
C504	120.1	151.5	2301-000015	C-FILM,PEF	10nF,5%,100V,7x3.2x7mm,5mm,TP	
C505	117	175.8	2301-000184	C-FILM,PEF	1nF,10%,100V,5.3x10mm,5mm,TP	
C506	112.4	83.1	2201-000013	CAP-CERAMIC,471K,1H,Y5P	470PF,50V,10%,10%,Y5P,DISC-RADI	
C507	134.2	56.9	2303-000145	C-FILM,PPF	1nF,10%,2KV,23x13mm,7.5mm,TP	⚠
C509	139.3	152.6	2401-000050	C-AL	10uF,20%,16V,GP,5x11mm,2mm,TP	
C511	133.2	93.5	2301-001179	C-FILM,MPEF	680nF,5%,250V,TP,21x8.5x15,7.5	
C512	142	102.2	2201-000469	C-CERAMIC,DISC	330pF,10%,500V,Y5P,6x3.5,5,TP	
C514	133.4	172.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C515	133.4	172.7	2401-000660	C-FILM,MPEF	100nF,10%,63V,7.5x12.5mm,5mm,T	
C517	229.2	110.6	2401-001016	(T)50V 3.3M	CAP-AL.NP-ELEC,335M,1H,6X11	
C519	119.6	161	2305-000280	C-FILM,PEF	220NF, 10%, 63V,7.5X13.5mm,5mm,T	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
C520	215.4	27.1	2401-000044	(T)250V 3.3M	CAP-AL.ELEC,335M,2E	
C521	120.8	137.8	2401-000913	C-AL	22uF,20%,16V,GP,5x11mm,2mm,TP	
C522	158.3	54.2	2305-000012	C-FILM,MPEF	5.6nF,10%,250V,14.5X9.0X6.0,11	
C523	161.6	128.3	2301-000022	C-FILM,PEF	100nF,10%,200V,11.0X14.0X7.0,7	
C524	132.1	134.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C527	231.1	118.7	2401-000026	(T)50V 3.3M	CAP-AL.ELEC,335M,1H	
C528	139.5	181	2401-001334	C-AL	470nF,20%,50V,GP,5x11mm,2mm,TP	
C531	137.7	46.1	2401-000044	(T)250V 3.3M	CAP-AL.ELEC,335M,2E	
C535	110.6	132.5	2401-000374	(T)100UF,63V,20%,R-RADIAL	CAP-AL.ELEC,107M,1J,105C,10x12.5	
C541	229.1	60.7	2305-000421	(T)250V 473K	CAP-MPETP,473K,2E,5P	
C542	228.8	45.1	2201-000291	CAP-CERAMIC,102K,2H,Y5P	1NF,500V,20%,10%,Y5P,DISC-RADIA	
C543	204.9	53.5	2201-000469	C-CERAMIC,DISC	330pF,10%,500V,Y5P,6x3.5,5,TP	
C560	197.6	51.5	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C561	180.3	38.7	2401-000027	(T)50V 4.7M	CAP-AL.ELEC,475M,1H	
C562	184.9	37.6	2301-000016	(T)100V 223J	CAP-MYLAR,223J,2A,5P	
C563	199.7	40.5	2401-001166	(T)16V 33M	CAP-AL.ELEC,336M,1C	
C601	44	34.8	2501-000203	CAP-MPAPER,474K,250VAC	470NF,250VAC,10%,X2,RE-RAD,25.4	⚠
C602	56.6	34	2201-000019	CAP-CERAMIC,103Z,2H,DISC	10NF,500V,80-20%,Y5V,RADIAL	
C603	28.9	121.9	2301-000016	(T)100V 223J	CAP-MYLAR,223J,2A,5P	
C604	119.3	213.6	2401-000027	(T)50V 4.7M	CAP-AL.ELEC,475M,1H	
C605	26.4	113	2305-000280	C-FILM,PEF	220NF, 10%, 63V,7.5X13.5mm,5mm,T	
C606	77.1	60.9	2401-000052	CAP-AL.ELE,227M,2G,30X35	(B)220UF,400V,20%,R-RADIAL,TERM	⚠
C610	112.1	93.6	2301-000013	C-FILM,PEF	4.7NF,5%,100V,10.5x12.5x6.5mm, 5mm	
C612	68.7	77.5	2301-000013	C-FILM,PEF	4.7NF,5%,100V,10.5x12.5x6.5mm, 5mm	
C613	32.9	92.8	2201-000019	CAP-CERAMIC,103Z,2H,DISC	10NF,500V,80-20%,Y5V,RADIAL	
C615	66	91.5	2301-000010	C-FILM,PEF	100nF,5%,100V,11.5x12.5mm,5mm	
C616	56.3	83.6	2401-001195	C-AL	33uF,20%,50V,GP,8x11.5mm,5mm,T	
C617	41.2	92	2201-000012	C-CERAMIC,DISC	220pF,10%,1KV,Y5P,6.3x5,5,TP	
C618	61.7	83	2401-000027	(T)50V 4.7M	CAP-AL.ELEC,475M,1H	
C620	29.9	174.7	2401-000039	(T)1000UF,16V,20%,R-RADIA	CAP-AL.ELEC,108M.1C,10x16	
C622	63.5	162	2401-001869	(T)100UF,100V,20%,R-RADIA	CAP-AL.ELEC,107M.2A,10X20	
C624	44.9	175.5	2401-001442	C-ALUMINUM	470UF,20%,63V,GP,13x25mm, 5mm,T	
C627	66.6	172.3	2401-000151	(T)1000UF,35V,20%,R-RADIA	CAP-AL.ELEC,108M.1E,12.5x20	
C628	167.5	222.5	2401-000038	C-AL	470uF,20%,25V,GP,10x12.5mm,5mm	
C629	79.7	170.9	2401-000039	(T)1000UF,16V,20%,R-RADIA	CAP-AL.ELEC,108M.1C,10x16	
C630	17.2	181.5	2401-000151	(T)1000UF,35V,20%,R-RADIA	CAP-AL.ELEC,108M.1E,12.5x20	
C642	55.7	171.4	2201-000291	CAP-CERAMIC,102K,2H,Y5P	1NF,500V,20%,10%,Y5P,DISC-RADIA	
C643	12.4	168.5	2301-000287	(T)100V 562J	CAP-MYLAR,562J,2A,5P	
C644	15.3	137.6	2401-000053	(T)25V 10M	CAP-AL.ELEC,106M,1E	
C645	6.4	148.6	2301-000011	C-FILM,PEF	1nF,5%,100V,10.5x12.5x6.5,5mm	
C652	111.2	27.6	2401-000038	C-AL	470uF,20%,25V,GP,10x12.5mm,5mm	
C653	28.2	127.6	2201-000023	C-CERAMIC,DISC	2.2nF,20%,125V,Y5U,11x7,5,TP	⚠
C656	138	225.2	2401-000037	(T)470UF,16V,20%,R-RADIA	CAP-AL.ELEC,477M,1C,8x11.5	
CF202	131	28	BH39-40364G	CBF-HARNESS	20P,250MM,BLK/WHT/RED/BLU,UL10	
CF702	93.6	8.8	BH39-40357D	CBF-HARNESS	2P,100MM,BLK/WHT,UL 1007,AWG22	
CN201	59.9	251.6	3711-003595	CONNECTOR-HEADER	BOX,13P,1R,2mm,STRAIGHT,SN	
CN301	50	220.1	3711-001483	STRAIGHT,SN,9.15MM	CON-NOWALL HEADER,3P,1R	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
CN400	222.4	171.6	3712-000338	CONNECTOR-TERMINAL	PIN,MALE,2.36mm	
CN401	230.4	171.6	3712-000338	CONNECTOR-TERMINAL	PIN,MALE,2.36mm	⚠
CN402	212.4	171.6	3712-000338	CONNECTOR-TERMINAL	PIN,MALE,2.36mm	
CN602	65.2	28.2	3711-000217	STRAIGHT,1WALL	CON-WALL HEADER,3P,3.96	
CN63	57.2	62.8	3712-000338	CONNECTOR-TERMINAL	PIN,MALE,2.36mm	
CN64	57	70.5	3712-000338	CONNECTOR-TERMINAL	PIN,MALE,2.36mm	
D202	66.9	255.1	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D203	53.8	275.7	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D204	71.7	238.2	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D301	26.1	206.4	0402-000128	70V,1A,1.1V,1A,2000NS,0.5A	DIODE-REC,1N4002,DO-41	
D310	103.1	241.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D402	174.5	150.3	0402-000272	DIODE-RECTIFIER	UF4001,50V,1A,DO-41	
D403	217	137.8	0402-001172	DIODE-RECTIFIER	YG123S15,1500V,8A,TO-220,ST	
D404	179	239.2	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D405	160.8	219.7	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D406	233.1	232.6	0402-000546	DIODE-RECTIFIER	TVR10G,400V,1.0A,DO-41	
D407	218.1	236.4	0402-000546	DIODE-RECTIFIER	TVR10G,400V,1.0A,DO-41	
D408	202.6	219.4	0402-000274	400V,1A,1V,1A,50NS,0.5A	DIODE-REC,UF4004,DO-41	
D410	190.4	242	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D411	126.4	212.3	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D412	190	263.3	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D413	178.5	286.8	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D414	177.8	246.7	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D415	104.8	225.2	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D501	138.1	157.6	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D502	120.6	155.1	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D508	146.4	102.2	0402-000274	400V,1A,1V,1A,50NS,0.5A	DIODE-REC,UF4004,DO-41	
D511	146.2	141.6	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D515	126.6	125.7	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D517	171.1	124.2	0402-000546	DIODE-RECTIFIER	TVR10G,400V,1.0A,DO-41	
D518	171.1	130.3	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D519	188.6	56.8	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D520	171.1	45.6	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D522	124.2	28.7	0402-000546	DIODE-RECTIFIER	TVR10G,400V,1.0A,DO-41	
D523	120.7	45.9	0402-000546	DIODE-RECTIFIER	TVR10G,400V,1.0A,DO-41	
D524	162.9	66.8	0402-000007	DIODE-RECTIFIER	1N4937GP,600V,1A,DO-41	
D525	160.4	49.8	0401-000006	DIODE-SWITCHING	BAV21,200V,250mA,400mW,50nS,DO	
D601	58.6	46.3	0402-001111	DIODE-RECTIFIER	1N5397GP,600V,1.5A,DO-204AC,TP	
D602	63.6	57.2	0402-001111	DIODE-RECTIFIER	1N5397GP,600V,1.5A,DO-204AC,TP	
D603	67.3	55.3	0402-001111	DIODE-RECTIFIER	1N5397GP,600V,1.5A,DO-204AC,TP	
D604	55	39.3	0402-001111	DIODE-RECTIFIER	1N5397GP,600V,1.5A,DO-204AC,TP	
D605	66.2	115.3	0402-000546	DIODE-RECTIFIER	TVR10G,400V,1.0A,DO-41	
D609	37.5	83.2	0402-000012	DIODE-RECTIFIER	UF4007,1KV,1A,DO-41	
D610	42.1	150.2	0402-000012	DIODE-RECTIFIER	UF4007,1KV,1A,DO-41	
D611	119.5	106.2	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D612	55.4	167.9	0402-000546	DIODE-RECTIFIER	TVR10G,400V,1.0A,DO-41	
D614	41.5	83.2	0402-000017	DIODE-RECTIFIER	RGP02-12,1200V,0.5A,DO-204AL	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
D615	32.1	164.2	0402-000546	DIODE-RECTIFIER	31DF4,400V,3A,DO-201AD	
D617			0402-000005	DIODE-RECTIFIER	31DF4,400V,3A,DO-201AD	
D618	72.4	150.5	0402-000014	DIODE-RECTIFIER	RG2,400V,1.2A,DO-201	
D619	22.2	152.6	0402-000005	DIODE-RECTIFIER	31DF4,400V,3A,DO-201AD	
D620	77.2	150.5	0402-000546	DIODE-RECTIFIER	TVR10G,400V,1.0A,DO-41	
D641	65.8	184.2	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D666	75.4	81.7	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
F601	206.9	86.6	3601-000004	FUSE-FERRULE	EYELET	⚠
FH601	7.7	30.5	3602-000001	800GF,400-800GF	FUSE-CLIP,5.2X20,30MOHM	⚠
HS301	45	198.7	BH62-30018A	TRANS-POWER	A1050S, T3, CQA4157,HEAT_SINK/IC	
HS407	149.2	34.6	BH99-10048C	HEAT/SINK-FBT	A1050S,T1.0,CKB7227	
HS504	137.6	112.9	BH62-30024A	COM, H/S-TR	A1050S, T1.0, CFX1577	
HS601	71.1	100.2	BH99-10035B	HEAT_SINK	A6063, T2, CGX1607	
HS607	152.2	228.8	BH62-30024A	COM, H/S-TR	A1050S, T1.0, CFX1577	
IC201	35	299	BH09-10304B	IC-MICOM MASKING	CKG7507,LSC442872B,42P	⚡
IC202	79.5	260.5	1103-001003	IC-EEPROM	24LC41,512X8BIT,DIP,8P,300MIL	⚠
IC301	48.8	210	1204-000013	IC-VERTICAL PROCESSO	TDA9302H,TO-220,9P,PLASTIC,3	⚠
IC401	123.5	296.6	1204-001003	IC-CONSUMER,UPC1883	IC-H/V PROCESSOR	⚠
IC402	178.2	279.1	1203-001054	IC-PWM CONTROLLER	KA3883,DIP,8P,300MIL,PLASTIC,4.9	⚠ ⚡
IC501	125.7	162.6	1203-000182	IC-POSI.ADJUST REG.	494,DIP,16P,300MIL,PLASTIC	⚠
IC502	183.6	46.4	1201-000420	IC-OP AMP	358,DIP,8P,300MIL,DUAL,100V/mV	
IC601	44.6	92.2	BH13-10335J	IC-HYBRID	CKA5227,KA2S0680,SIP,5P,FET+CO	⚠ ⚡
IC602	13.6	134.3	0604-001018	PHOTO-COUPLE	DAR-TR, 63-125%, 200mW, DIP-4, RST	⚠
IC603	10.3	153.6	1203-000002	TO-92,3,36V(T)-SIMPLE	IC-LIN,431,REGULATOR	⚠
IC606	14.7	252.3	1203-000001	TO-220,3,5V	IC-LIN,7805,REGULATOR	
IC607	154.4	226.3	1203-000442	IC-POSI.FIXED REG.	7812,TO-220,3P,PLASTIC,11.5/	⚡
IS601	27.3	4	2901-000003	FILTER-EMI AC LINE	250V,3A	⚠
L401	226.7	218.4	BH27-20343G	COIL-PEAKING	500UH,10%,DR8*8,TP	
L402	234.7	155	BH27-20003A	COIL-LINEARITY	0.06OHM,0.15,DR-1415,IVORY,35M	
L403	237	142.5	BH27-20343F	COIL-PEAKING	66.0UH,10%,DR8*8,TP	
L404	123.4	235.9	2701-000128	INDUCTOR-AXIAL	15uH,10%,4.2x9.8mm	
L405	214.6	222.3	BH27-20343H	COIL-PEAKING	2.7MH,10%,DR8*8,TP	
L406	234	185.6	BH27-20343E	COIL-PEAKING	27.OUH,10%,DR8*8,TP	
L407	193	207.1	BH27-20310H	COIL-CHOKE	0.18OHM,16.7*27.8,B,USTC0.	
L501	113.9	117.8	BH27-20342E	COIL-CHOKE	80UH,20%,DR14-20,BULK	
L502	151.8	63	2701-000154	INDUCTOR-AXIAL	220uH,10%,4.2x9.8mm	
L601	33.1	62.5	BH27-20307E	39UH(25X32)	COIL-LINE FILTER	⚠
OP101	81.4	13.8	0601-001047	LED	ROUND,GRN/YEL,2mm,585nm	
PR601	65.1	15.4	1404-000002	THERMISTOR-NTC	9OHM,20%	
Q201	29.4	301.1	0501-000389	TR-SMALL SIGNAL	KSC815,NPN,400mW,TO-92,TP,120-	
Q202	26.2	257.5	0501-000389	TR-SMALL SIGNAL	KSC815,NPN,400mW,TO-92,TP,120-	
Q203	94.9	256.4	0501-000389	TR-SMALL SIGNAL	KSC815,NPN,400mW,TO-92,TP,120-	
Q301	70.8	226.6	0501-000389	TR-SMALL SIGNAL	KSC815,NPN,400mW,TO-92,TP,120-	
Q302	74.7	279.6	0501-000389	TR-SMALL SIGNAL	KSC815,NPN,400mW,TO-92,TP,120-	
Q401	139.7	202.4	0501-000122	0.625W,60V,40V,6V,0.2A	TR-NPN,2N3904,TO-92,EBC	
Q402	144.6	202.4	0501-000581	0.625W,40V,40V,5V,0.2A	TR-PNP,2N3906,TO-92,EBC	
Q403	156.3	187.1	0501-000412	0.625W,300V,300V,6V,0.5A	TR-NPN,MPSA42,TO-92,EBC	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
Q404	121.4	244	0501-000010	0.8W,80V,60V,8V,0.7A	TR-NPN,KSC1008,TO-92,ECB	
Q405	209.5	253.7	0505-001102	FET-SILICON	IRFR/U230A,N,200V,7.5A,400mohm	
Q406	174.7	139.5	0502-001001	TR-POWER	KSC5088,NPN,1500V,1500V,8A,50W	
Q407	229	288.4	0501-000010	0.8W,80V,60V,8V,0.7A	TR-NPN,KSC1008,TO-92,ECB	
Q408	205.5	266.8	0505-001102	FET-SILICON	IRFR/U230A,N,200V,7.5A,400mohm	
Q409	205.4	284.7	0505-001102	FET-SILICON	IRFR/U230A,N,200V,7.5A,400mohm	
Q410	174.8	289.3	0501-000303	0.25W,-60V,-50V,-5V,-0.15A	TR-PNP,KSA733,TO-92,EBC	
Q411	202.6	225	0505-001102	FET-SILICON	IRF630A,N,200V,9A,0.4ohm,75W	
Q412	170.5	231.5	0501-000122	0.625W,60V,40V,6V,0.2A	TR-NPN,2N3904,TO-92,EBC	
Q413	194.2	247.6	0501-000122	0.625W,60V,40V,6V,0.2A	TR-NPN,2N3904,TO-92,EBC	
Q501	121.9	87.2	0501-000122	0.625W,60V,40V,6V,0.2A	TR-NPN,2N3904,TO-92,EBC	
Q502	121.8	171.5	0501-000483	0.625W,75V,40V,6V,0.6A	TR-NPN,MPS2222A,TO-92,EBC	
Q503	144.7	78	0502-000009	TR-POWER	KSC5386,NPN,1500V,1500V,7A,50W	⚠
Q504	135.1	110.3	0505-000023	FET-SILICON	IRF740,N,400V,10A,0.55ohm,125W	
Q505	120.7	71.3	0501-000321	TR-SMALL SIGNAL	KSB1116-Y,PNP,0.75W,TO-92,13	
Q506	138.6	137.9	0501-000303	0.25W,-60V,-50V,-5V,-0.15A	TR-PNP,KSA733,TO-92,EBC	
Q510	115.2	71.3	0501-000404	TR-SMALL SIGNAL	KSD1616-Y,NPN,750mW,TO-92,TP,1	
Q513	62.7	244.8	0501-000303	0.25W,-60V,-50V,-5V,-0.15A	TR-PNP,KSA733,TO-92,EBC	
Q514	200	48.3	0501-000412	0.625W,300V,300V,6V,0.5A	TR-NPN,MPSA42,TO-92,EBC	
Q603	112.1	210	0501-000321	TR-SMALL SIGNAL	KSB1116-Y,PNP,0.75W,TO-92,13	
Q604	153.1	244.6	0501-000389	TR-SMALL SIGNAL	KSC815,NPN,400mW,TO-92,TP,120-	
Q605	74.6	185.1	0501-000321	TR-SMALL SIGNAL	KSB1116-Y,PNP,0.75W,TO-92,13	
Q606	61.9	194.5	0501-000389	TR-SMALL SIGNAL	KSC815,NPN,400mW,TO-92,TP,120-	
Q608	103.8	27.5	0501-000010	0.8W,80V,60V,8V,0.7A	TR-NPN,KSC1008,TO-92,ECB	
R200	68.1	316	2001-000562	REF-CF,27K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R201	50.9	303.5	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R202	32.9	306	2001-000077	REF-CF,47K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R203	32.9	316	2004-001211	R-METAL	7.5Kohm,1%,1/4W,AA,TP,2.4x6.4m	
R204	32.9	308.5	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R205	56.7	281.7	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R206	32.9	311	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R207	26.8	288.7	2001-000097	REF-CF,1M,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R208	45.5	246.9	2001-000059	R-CARBON	5.6Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R209	40.3	235.4	2001-000868	REF-CF,56,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R210	67.4	312.3	2001-000069	REF-CF,12K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R211	48.1	246.9	2001-000059	R-CARBON	5.6Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R212	40.3	238	2001-000868	REF-CF,56,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R213	14.5	277.1	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R214	14.5	274.5	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R216	25.7	308.3	2001-000051	REF-CF,2.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R217	14.5	271.8	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R218	14.5	268.4	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R220	57.8	270.8	2001-000868	REF-CF,56,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R223	57.8	273.4	2001-000562	REF-CF,27K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R224	68.7	262.5	2001-000064	REF-CF,7.5K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R225	57.7	268.2	2001-000868	REF-CF,56,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R226	53.6	284.9	2001-000083	R-CARBON	82Kohm,5%,1/6W,AA,TP,1.8x3.2mm	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R228	14.7	302.6	2001-000034	REF-CF,220,5%,1/4W	250V,-350 TO +350PPM/C,R-AXIAL	
R229	65.6	287.6	2001-000562	REF-CF,27K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R230	63	251.7	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R231	66.6	292.7	2001-000836	R-CARBON	51Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R232	75.3	312.4	2001-000108	REF-CF,18K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R233	54.6	295.4	2001-000644	R-CARBON	330Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R234	72.8	297.4	2001-000547	R-CARBON	270Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R235	77.8	312.4	2001-000108	REF-CF,18K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R236	54.6	298	2001-000644	R-CARBON	330Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R237	70.1	312.4	2001-000089	R-CARBON	150Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R238	56.7	279.1	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R240	80.3	312.4	2001-000089	R-CARBON	150Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R243	99.9	241.7	2003-000669	R-METAL OXIDE(S)	390ohm,5%,1W,AA,TP,3.3x9mm	
R245	61.4	315	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R246	31.3	264.1	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R247	115.8	276.7	2004-000193	R-METAL	100Kohm,1%,1/4W,AA,TP,2.4x6.4m	
R255	121.8	299.8	2001-000108	REF-CF,18K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R256	82.7	297.4	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R257	103.1	295.9	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R258	103.1	308.5	2001-000562	REF-CF,27K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R259	119.9	275.2	2001-000976	REF-CF,8.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R260	80	284	2001-000083	R-CARBON	82Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R261	96.3	218.2	2001-000040	REF-CF,470,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R280	69.1	259.9	2001-000868	REF-CF,56,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R281	74	271.6	2001-000868	REF-CF,56,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R282	77.5	264	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R283	90.4	244.5	2001-000028	R-CARBON(S)	100ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R284	89	269	2001-000868	REF-CF,56,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R285	73.8	265	2001-000051	REF-CF,2.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R302	86.5	320.4	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R303	89.3	211.7	2004-001254	R-METAL	8.2Kohm,1%,1/4W,AA,TP,2.4x6.4m	
R304	64	212.5	2004-001022	R-METAL	5.6Kohm,1%,1/4W,AA,TP,2.4x6.4m	
R305	52	209	2001-001088	REF-CF,1K,5%,1/2W(S)	300V,-200 TO +200PPM/C,R-AXIAL	
R306	71.8	220.2	2003-000422	REF-MO,1.2,5%,2W(S)	350V,-350 TO +350PPM/C,R-AXIAL	
R307	28.4	227.7	2001-001053	R-CARBON(S)	1.5ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R308	139.5	309.9	2001-000051	REF-CF,2.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R309	74	232.3	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R310	75.4	216.2	2001-000538	REF-CF,24K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R311	123.9	258.4	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R313	49.6	228.4	2001-000042	R-CARBON	1Kohm,5%,1/4W,AA,TP,2.4x6.4mm	
R314	31.5	223.4	2004-001137	R-METAL	6.8Kohm,1%,1/8W,AA,TP,1.8x3.2m	
R315	103.1	244.3	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R316	83.4	220.7	2001-000069	REF-CF,12K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R333	132.8	255	2004-000218	R-METAL	10Kohm,1%,1/8W,AA,TP,1.8x3.2mm	
R334	121.1	255	2004-000728	R-METAL	3.9Kohm,1%,1/4W,AA,TP,2.4x6.4m	
R400	147.7	293.5	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R401	152.6	281.5	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R403	133.8	302.3	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R404	150.8	309.7	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R405	137.5	274.5	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R407	131.4	265.5	2001-000001	R-CARBON	2Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R408	142.2	265.4	2001-000496	REF-CF,20K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R409	133.8	304.9	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R410	130.8	236	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R414	149.5	202.7	2001-000029	REF-CF,100,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R415	131.3	207.3	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R416	152.8	186.6	2001-000040	REF-CF,470,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R417	123.4	189.4	2003-002108	R-METAL OXIDE(S)	300ohm,5%,3W,AA,TP,15x5.5mm	
R418	147.8	181.8	2003-000512	REF-MO,15K,5%,3W(S)	500V,-200 TO +200PPM/C,R-AXIAL	
R419	164.9	187.1	2003-000793	R-METAL OXIDE(S)	8.2Kohm,5%,2W,AA,TP,4x12mm	
R420	233.1	228.8	2003-000765	R-METAL OXIDE(S)	680ohm,5%,1W,AA,TP,3.3x9mm	
R421	178.9	167.7	2003-000407	R-METAL OXIDE(S)	0.6ohm,5%,2W,AA,TP,4x12mm	
R422	174.5	147.1	2001-000020	R-CARBON(S)	22ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R423	213.1	241.3	2001-000790	R-CARBON	47ohm,5%,1/2W,AA,TP,3.3x9mm	
R424	229.4	192.4	2001-000084	REF-CF,100K,5%,1/4W	250V,-600 TO -150PPM/C,R-AXIAL	
R425	172.1	267.6	2001-001030	REF-CF,91K,5%,1/6W	200V,-800PPM/C,R-AXIAL	
R426	228.4	178.4	2001-000037	REF-CF,330,5%,1/2W(S)	300V,-200 TO +200PPM/C,R-AXIAL	
R427	216.6	165.1	2001-000037	REF-CF,330,5%,1/2W(S)	300V,-200 TO +200PPM/C,R-AXIAL	
R428	206.5	219.3	2001-000023	REF-CF,47,5%,1/4W	250V,-350 TO +350PPM/C,R-AXIAL	
R429	210.2	309.8	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R430	172.1	257.4	2001-000054	R-CARBON	3.9Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R431	198.1	296.3	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R433	202.4	274.3	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R436	198.1	289.5	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R437	169.5	249.4	2001-000072	REF-CF,22K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R438	183.1	219	2003-000428	R-METAL OXIDE(S)	1.5Kohm,5%,1W,AA,TP,3.3x9mm	
R439	183.7	239.5	2001-000923	R-CARBON	680ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R440	192.9	225.6	2003-000407	R-METAL OXIDE(S)	0.6ohm,5%,2W,AA,TP,4x12mm	
R443	198.5	261	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R444	195.5	261	2001-000456	REF-CF,2.2,5%,1/4W	250V,-350 TO +350PPM/C,R-AXIAL	
R445	198.1	292.1	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R446	151.9	265.1	2001-000562	REF-CF,27K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R449	160.1	268.7	2001-000080	REF-CF,62K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R452	168	273.2	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R453	164.6	241.7	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R454	175.3	249.3	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R455	173.5	273.2	2001-000688	REF-CF,390K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R456	175.3	252	2001-001088	REF-CF,1K,5%,1/2W(S)	300V,-200 TO +200PPM/C,R-AXIAL	
R458	173.3	226	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R459	175.9	236.1	2001-000976	REF-CF,8.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R461	178.5	283	2001-000080	REF-CF,62K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R462	194.7	286.9	2001-000110	R-CARBON	10ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R465	174.5	260.8	2001-000077	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R466			2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R467	133.5	241.4	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R468	131.4	244.6	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R469	120	221.8	2001-000109	R-CARBON(S)	470ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R471	171.3	287.8	2001-001030	200V,-800PPM/C,R-AXIAL	REF-CF,91K,5%,1/6W	
R472	167	249.4	2001-000644	R-CARBON	330Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R500	116.2	178.3	2001-000976	REF-CF,8.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	⚠
R501	123.2	180.8	2001-000053	R-CARBON	3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m	⚠
R502	111.7	86.1	2001-000040	REF-CF,470,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R503	111.5	79.8	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R505	135.8	68.7	2001-000021	REF-CF,27,5%,1/4W	250V,-350 TO +350PPM/C,R-AXIAL	
R506	116.9	46.2	2003-000659	REF-MO,33,5%,1W(S)	350V,-350 TO +350PPM/C,R-AXIAL	
R507	124.8	71.4	2001-000211	REF-CF,1,5%,1/4W	250V,-350 TO +350PPM/C,R-AXIAL	
R508	133.6	102.3	2003-000428	R-METAL OXIDE(S)	1.5Kohm,5%,1W,AA,TP,3.3x9mm	
R509	114.1	166.8	2001-000688	REF-CF,390K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	⚠
R510	138.1	160.1	2001-000722	R-CARBON	4.3Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R511	138.5	135.2	2001-000456	REF-CF,2.2,5%,1/4W	250V,-350 TO +350PPM/C,R-AXIAL	
R512	138.3	144.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R513	145.6	162.6	2001-000106	REF-CF,1.5K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R514	125.4	170	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	⚠
R515	135.9	117.1	2001-000077	REF-CF,47K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R516	186.1	127.5	2001-000057	REF-CF,5.1K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R517	232	94	2004-004049	R-METAL	96Kohm,1%,1/8W,AA,TP,1.8x3.2mm	⚠
R518	114.1	164.3	2001-000976	REF-CF,8.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R519	120.6	157.7	2001-000072	REF-CF,22K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R520	145	111	2001-001038	R-CARBON(S)	0.56ohm,5%,1/2W,AA,TP,2.4x6.4m	
R521	114.3	148.5	2001-000064	REF-CF,7.5K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	⚠
R522	145.8	47.9	2003-000012	REF-MO,100K,5%,1W(S)	350V,-200 TO +200PPM/C,R-AXIAL	
R523	145	108.2	2001-001038	R-CARBON(S)	0.56ohm,5%,1/2W,AA,TP,2.4x6.4m	
R528	69.5	248.2	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R534	54	246.7	2001-000091	REF-CF,220K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R535	209.8	61.6	2001-000053	R-CARBON	3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R536	163.4	124.1	2001-001164	REF-CF,56K,5%,1/2W(S)	300V,-200 TO +200PPM/C,R-AXIAL	
R537	124.8	62.7	2001-000019	R-CARBON(S)	10ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R538	124.8	65.8	2001-000018	REF-CF,6.8,5%,1/4W	250V,-350 TO +350PPM/C,R-AXIAL	
R540	175.3	32.7	2001-000976	REF-CF,8.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R541	157.9	236.7	2001-000072	REF-CF,22K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R542	170.9	40.1	2004-000218	R-METAL	10Kohm,1%,1/8W,AA,TP,1.8x3.2mm	⚠
R543	170.9	42.9	2004-000218	R-METAL	10Kohm,1%,1/8W,AA,TP,1.8x3.2mm	⚠
R544	176.1	57	2004-000900	R-METAL	4.7Kohm,1%,1/8W,AA,TP,1.8x3.2m	⚠
R545	170.5	49	2004-000218	R-METAL	10Kohm,1%,1/8W,AA,TP,1.8x3.2mm	⚠
R548	155	38.8	2004-000515	R-METAL	200Kohm,1%,1/4W,AA,TP,2.4x6.4m	⚠
R549	142.8	43	2001-000097	REF-CF,1M,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R556	224.8	54.9	2003-000455	REF-MO,100,5%,2W(S)	500V,-200 TO +200PPM/C,R-AXIAL	
R557	224.8	58.6	2001-000642	REF-CF,330K,5%,1/2W	350V,-600 TO -150PPM/C,R-AXIAL	
R558	205.5	31.7	2001-001106	REF-CF,220K,5%,1/2W(S)	300V,-200 TO +200PPM/C,R-AXIAL	
R560	174.3	43	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R561	188.6	49	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R562	188.6	54	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R563	186.8	33	2001-000097	REF-CF,1M,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R564	188.6	44.1	2001-000093	REF-CF,470K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R565	202.9	42.8	2001-000059	R-CARBON	5.6Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R566	188.6	46.5	2001-000051	REF-CF,2.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R567	88.8	203.3	2001-000072	REF-CF,22K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R568	188.7	37.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R579	146.4	83.5	2001-000107	REF-CF,150K,5%,1/2W(S)	300V,-200 TO +200PPM/C,R-AXIAL	
R589	204.6	26.2	2001-001113	REF-CF,270K,5%,1/2W(S)	300V,-200 TO +200PPM/C,R-AXIAL	
R590	157.8	49.8	2004-001319	R-METAL	86Kohm,1%,1/4W,AA,TP,2.4x6.4mm	⚠
R601	51	36	2001-000642	REF-CF,330K,5%,1/2W	350V,-600 TO -150PPM/C,R-AXIAL	⚠
R610	64.9	77.6	2001-000034	REF-CF,220,5%,1/4W	250V,-350 TO +350PPM/C,R-AXIAL	
R611	51.9	88.8	2001-001079	R-CARBON(S)	15ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R613	50.2	59.5	2003-000771	R-METAL OXIDE(S)	68Kohm,5%,2W,AA,TP,4x12mm	
R614	34	69.3	2003-000738	R-METAL OXIDE(S)	56Kohm,5%,2W,AA,TP,4x12mm	
R617	45.3	87.1	2003-000685	R-METAL OXIDE(S)	4.7Kohm,5%,2W,AA,TP,4x12mm	
R620	46.3	164.2	2001-000114	REF-CF,180K,5%,1/2W(S)	300V,-200 TO +200PPM/C,R-AXIAL	
R626	157.6	240.6	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R628	8.9	165	2001-000889	REF-CF,6.8K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R629	15.4	154.2	2004-001099	R-METAL	56Kohm,1%,1/4W,AA,TP,2.4x6.4m	⚠
R634	7.1	137.6	2001-000106	REF-CF,1.5K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	⚠
R635	138.8	210.1	2001-001138	REF-CF,390,5%,1/2W(S)	300V,-200 TO +200PPM/C,R-AXIAL	
R636	31.3	240.7	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R637	10	137.6	2001-000106	REF-CF,1.5K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	⚠
R639	19	235.1	2001-000056	REF-CF,4.7K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R640	70.9	184.2	2001-000077	REF-CF,47K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R641	68.4	184.2	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R642	81.7	181	2001-000245	R-CARBON	1.5ohm,5%,1/2W,AA,TP,3.3x9mm	
R643	99.1	27	2001-000023	REF-CF,47,5%,1/4W	250V,-350 TO +350PPM/C,R-AXIAL	
R645	59	179	2001-000432	REF-CF,1M ,5%,1/4W	250V,-1000 TO -500PPM/C,R-AXIAL	
R647	37.9	164.2	2001-000066	R-CARBON(S)	10Kohm,5%,1/2W,AA,TP,2.4x6.4mm	
R650	94.5	102.5	2001-000111	R-CARBON	150ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R685	115.3	214.5	2001-000105	R-CARBON	1.5Kohm,5%,1/4W,AA,TP,2.4x6.4m	
R686	115.9	210.8	2001-000077	REF-CF,47K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R687	96.7	184	2001-000048	REF-CF,2.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R688	14.2	231.8	2001-000524	REF-CF,22,5%,1/2W	350V,-350 TO +350PPM/C,R-AXIAL	
RL401	215.7	184.7	3501-001064	RELAY-POWER	12Vdc,0.36W,2A,1FormC,10mS,5mS	
RL601	93.6	37.6	3501-000136	RELAY-MINIATURE	12V,360mW,5A,1FormA,10mS,10mS	⚠
SOUND	7.1	184	3711-001489	STRAIGHT,SN,2.54MM,6MM	CON-NOWALL HEADER,3P,1R	
SW401	239.3	231.7	3406-000002	ON-ON-ON,STRAIGHT	SWITCH-TOGGLE,SP3T	
SW601	14	78.4	3403-000190	SWITCH-PUSH	250V,5A,SPST,ON-OFF	⚠
SW601.	18.5	72.6	3403-000291	250V,80A,DPST,Y,LUG	SWITCH-KEY,DPST	⚠
T401	168.8	174.1	BH26-30303Y	TRANS-HOR.DRIVE	6-4(50MH),6P,EE2017,SB-5S,6-	⚠
T402	198	176.2	BH26-30336D	TRANS-HOR.PULSE	1.5MH,10P,EER2828,PM-2,PL-3,1.	⚠
T501	218.4	108.4	BH26-10335L	TRANS-FBT	850UH,14P,SM19C,850UH,FKI	⚠
T503	222	35.9	BH26-30337J	TRANS-FOCUS	630uH,10P,EE1916,PL-3,EE19	
T601	36	118.9	BH26-20335Z	TRANS-POWER	360uH/60uH,18P,EER3942,PL-3,7	⚠

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
T602	81.3	84.9	BH26-30302S	TRANS-SYNC.	3-1(250UH),SB-5S,UU1116,3-	⚠
TH601	57.1	62.9	1404-001020	THERMISTOR-NTC	8ohm,15%,17mW/C, BK	⚠
VR402	151.1	273.9	2103-000209	VR-SEMI	1Kohm,30%,1/10W,TOP	
VR501	232.9	77.4	2103-000454	VR-SEMI	50Kohm,25%,0.3W,SIDE	☢
X201	30.4	288.4	2802-001084	RESONATOR-CERAMIC	4MHz,0.2%,TP,10x7.5x4.5	
ZD201	101.9	249.1	0403-000005	DIODE-ZENER	UZ5.1B,5.1V,4.8-5.4V,500mW,DO-	
ZD202	101.9	251.5	0403-000005	DIODE-ZENER	UZ5.1B,5.1V,4.8-5.4V,500mW,DO-	
ZD401	139.4	247.6	0403-000355	DIODE-ZENER	UZ5.1BSB,5.1V,4.97-5.18V,500mW	
ZD402	104.8	228.1	0403-001170	DIODE-ZENER	MTZJ9.1C,8.83V-9.30V,500mW,DO-	
ZD501	104.8	228.1	0403-000355	DIODE-ZENER	MTZJ9.1C,8.83V-9.30V,500mW,DO-	
ZD601	26.3	116.3	0403-001068	DIODE-ZENER	UZ4.7BSA,4.7V,4.47-4.65V,500mW	

9-2 Video PCB Parts

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
BD100	211.5	119	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD101	146	153.4	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD102	17.2	37.4	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD103	126.4	138.6	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD104	214.8	152.5	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD105	212.2	143.3	3301-000011	MAG-CORE,FERRITE,BEAD	1.2UH,3.5_5.7MM,10 OHM	
BD139	38.5	87	3301-000011	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C102			2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C105	213	136	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C106	120.5	84.2	2401-000943	(T)25V 22M	CAP-AL.ELEC,226M,1E	
C108	209.5	92	2401-000597	(T)50V 1M	CAP-AL.ELEC,105M,1H,4X7	
C109	125.9	113.5	2401-000025	(T)16V 100M	CAP-AL.ELEC,107M,1C	
C110	116.6	121.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C112	126.4	127.1	2401-000029	C-AL	10uF,20%,100V,GP,8x11.5mm,5mm	
C113	153.7	80	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C114	149.6	78.3	2401-000943	(T)25V 22M	CAP-AL.ELEC,226M,1E	
C115	153.4	70.2	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C116	157.1	75.5	2201-000378	CAP-CERAMIC,221K,1H,Y5P	220PF,50V,10%,10%,Y5P,DISC-RADI	
C117	167.1	77.6	2201-000378	CAP-CERAMIC,221K,1H,Y5P	220PF,50V,10%,10%,Y5P,DISC-RADI	
C118	167.1	63.2	2301-000021	(T)100V 683J	CAP-MYLAR,683J,2A,5P	
C119	174.5	77.6	2201-000010	CAP-CERAMIC,330J,1H,NPO	33PF,50V,5%,NPOPPM,NPO,DISC-RAD	
C120	178	77.6	2201-000010	CAP-CERAMIC,330J,1H,NPO	33PF,50V,5%,NPOPPM,NPO,DISC-RAD	
C121	179.5	95	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C122	186.4	96.2	2401-000042	(T)16V 100M	CAP-AL.ELEC,107M,1C	
C123	57.8	127.8	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C125	203.5	77.5	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C126	178.1	110	2401-000597	(T)50V 1M	CAP-AL.ELEC,105M,1H,4X7	
C127	186	71.7	2201-000487	C-CERAMIC,DISC	33pF,5%,50V,SL,4x3.5,5m,TP	
C128	193	77	2301-000011	C-FILM,PEF	1nF,5%,100V,10.5x12.5x6.5,5mm	
C129	220.6	142.6	2401-000025	(T)16V 100M	CAP-AL.ELEC,107M,1C	
C130	54.7	127.8	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C131	28.5	122	2401-000164	CAP-AL.ELEC,108M.1E	(T)1000UF,25V,20%,R-RADIAL,105C,12.5x20	
C132	225.2	128.6	2201-000011	C-CERAMIC,DISC	47pF,5%,50V,NPO,6.5x3.0,5,TP	
C133	196.5	97.9	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C134	21.2	66.9	2201-000530	C-CERAMIC,DISC	4.7nF,10%,500V,Y5P,12.5x4,5,TP	
C135	20.6	33.6	2201-000288	CAP-CERAMIC,102K,3D,DISC	1NF,2KV,10%,Y5P,DISC-RADIAL	
C136	199.2	124.2	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C137	40	147.3	2401-000029	C-AL	10uF,20%,100V,GP,8x11.5mm,5mm	
C138	221	132	2401-000053	(T)25V 10M	CAP-AL.ELEC,106M,1E	
C139	131	71.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C140	95.4	83.1	2401-000943	(T)25V 22M	CAP-AL.ELEC,226M,1E	
C141	104.2	107.9	2401-000025	(T)16V 100M	CAP-AL.ELEC,107M,1C	
C142	103.5	84.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
C143	183.5	155.5	2202-002008	C-CERAMIC,MLC-AXIAL	10nF,+80-20%,50V,Y5V,2.3X3.0	
C151	51	127.6	2401-001016	C-AL	3.3uF,20%,50V,BP,6x11mm,5mm,TP	
CB01	100.3	76.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CB03	137.9	96.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
CB04	93.9	115.9	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CB05	74.5	142.3	2305-000009	(T)250V 104J	CAP-MPETP,104J,2E,7.5P	
CB06	144.5	136	2301-000015	(T)100V 103J	CAP-MYLAR,103J,2A,5P	
CB09	172.5	117.5	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CF105	7	43	BH39-40356Z	CBF-HARNESS	8P,120MM,BLK/WHT,UL1007,AWG22	
CG01	107.4	76.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CG03	140.8	96.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CG04	113.8	107.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CG05	61	142.5	2305-000009	(T)250V 104J	CAP-MPETP,104J,2E,7.5P	
CG06	144.5	141.5	2301-000015	(T)100V 103J	CAP-MYLAR,103J,2A,5P	
CG09	197.5	115	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CG19	83.2	118	2201-000010	CAP-CERAMIC,330J,1H,NPO	33PF,50V,5%,NPOPPM,NPO,DISC-RAD	
CN101	101.5	53	3701-001013	15P,3R,FEMAIL,STRAIGHT	CONNECTRO-D-SUBMINIATURE	
CN102	190.4	156.5	3711-003856	CONNECTOR-HEADER	BOX,20P,1R,2mm,ANGLE,SN	
CN103	26	155	3711-000057	CONNECTOR-HEADER	BOX,3P,1R,2.5mm,ANGLE,SN	
CN104	13	91.3	3722-001105	JACK-DC POWER	3P/2C,5.5mm,AG,BLK,NO	
CN105	56	157	3711-001111	CONNECTOR-HEADER	BOX,8P,1R,2.50mm,ANGLE,SN	
CN106	36.9	155	3711-000194	CONNECTOR-HEADER	1WALL,3P,1R,2.5mm,ANGLE,SN	
CN13	60.6	57.6	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN14	21.8	40	BH71-40300A	PIN-HINGE	BRASS,D2.36,SN,HEAT/SINK	
CN201_1	237.9	29	3711-003873	CONNECTOR-HEADER	BOX,7P,1R,2mm,STRAIGHT,SN	
CN201_2	144.7	26.6	3711-003874	CONNECTOR-HEADER	BOX,6P,1R,2mm,ANGLE,SN	
CN702	235	10.5	3711-003343	CONNECTOR-HEADER	BOX,2P,1R,2mm,ANGLE,SN	
CR01	115.7	76.7	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CR03	144.1	96.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CR04	121.4	107.1	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CR05	48.5	143.5	2305-000009	(T)250V 104J	CAP-MPETP,104J,2E,7.5P	
CR06	144.5	147.5	2301-000015	(T)100V 103J	CAP-MYLAR,103J,2A,5P	
CR09	205	131	2202-002009	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,2.3X3.0	
CRT1	205	131	BH03-10337V	CRT-COLOR	100nF,+80-20%,50V,Y5V,2.3X3.0	
D104	204.5	72	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
D105	124.6	123.9	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DB01	101.5	65.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DB02	104	73.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DB03	71.4	141.7	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DB04	75	120	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DB05	80.5	151.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DG01	114.1	65.6	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DG02	111.5	73.6	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DG03	58	141.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DG04	68	120	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DG05	67.5	151	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DR01	124.2	65.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DR02	121.6	73.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DR03	45	143.5	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DR04	61	120	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	
DR05	54.5	151	0401-000005	75V,150MA,1V,10MA	DIODE-SIG,1N4148,DO-35	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
EY1	28.3	73.5	6042-000002	EYELET	ID1.5,OD2,L3.1,SN,BSS3-E/EH	
EY2	26	61.9	6042-000002	EYELET	ID1.5,OD2,L3.1,SN,BSS3-E/EH	
EY3	44.2	55.6	6042-000002	EYELET	ID1.5,OD2,L3.1,SN,BSS3-E/EH	
FT01	23.5	132	2901-001042	FILTER-EMI ON BOARD	50VDC,3A	
HS101	102.8	146	BH70-10440A	SHIELD-D.SUB	CGE7527,SPTE,T0.5	
HS102	6.1	81.9	BH70-10458B	SHIELD-DC-JACK	CGE7387,STPE,T0.3,G17E	
IC101	89.9	87.8	1201-001202	IC-VIDEO AMP	2140,DIP,28P,300MIL,SINGLE,P	⚠ ⚡
IC102	94.3	125.3	BH13-10334K	IC-HYBRID	G17E,LM2405,SIP,11P,CRT/DRIVER	⚠ ⚡
IC103	176.7	125.3	1201-000229	IC-OP AMP	324,DIP,14P,300MIL,QUAD,100V/m	⚠ ⚡
IC104	160	82.7	1204-001015	PR:IC-OSD PROCESSOR	LSC4350,DIP,24P,300MIL,PLASTIC	⚠ ⚡
IC105	218.1	116.5	0801-000337	IC-CMOS LOGIC	74HCT14,SCHIMITT INVERTER,DIP	⚠ ⚡
L101	156.8	79	2701-000125	INDUCTOR-AXIAL,150UH	FIX,150UH,10%,50,2.6X7MM	
L102	143.8	116.7	2701-000164	INDUCTOR-AXIAL	27uH,10%,4.2x9.8mm	
L103	140	156.7	2701-000128	INDUCTOR-AXIAL	15uH,10%,4.2x9.8mm	
LB01	49.2	38.1	2701-000173	INDUCTOR-AXIAL	330nH,20%,4.2x9.8mm	
LG01	9.7	56.9	2701-000173	INDUCTOR-AXIAL	330nH,20%,4.2x9.8mm	
LR01	26.5	31.8	2701-000173	INDUCTOR-AXIAL	330nH,20%,4.2x9.8mm	
Q102	187.2	65.7	0501-000492	TR-NPN,MPS3646,TO-92,EBC	40V,15V,5V,0.3A	
Q106	44.5	127.5	0501-000389	TR-NPN,KSC-815,TO-126,ECB	1W,-40V,-30V,-5V,-3A	
Q108	158.5	112.5	0501-000389	TR-SMALL SIGNAL	KSA733-Y,PNP,250mW,TO-92,120	
Q110	212.8	113.6	0501-000389	TR-NPN,MPSA42,TO-92,EBC	0.625W,300V,300V,6V,0.5A	
QB01			0501-000412	TR-NPN,MPSA42,TO-92,EBC	0.625W,300V,300V,6V,0.5A	
QG01	164.5	137.5	0501-000412	TR-NPN,MPSA42,TO-92,EBC	0.625W,300V,300V,6V,0.5A	
QR01	168.5	145.8	0501-000412	TR-NPN,MPSA42,TO-92,EBC	0.625W,300V,300V,6V,0.5A	
R102	127.2	84.7	2001-000976	REF-CF,8.2K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R103	124.8	84.7	2001-000051	R-CARBON	2.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R104	204.5	103	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R106	86.3	86.7	2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R107	147.9	101.3	2001-000048	R-CARBON	2.2Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R108	91.2	107.9	2001-000106	REF-CF,1.5K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R109	204.5	149.5	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R110	235.3	131.9	2001-000077	REF-CF,47K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R111	206	90.6	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R112	237.8	129.5	2001-000077	REF-CF,47K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R113	224	86.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R114	224	83.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R115	156.5	72	2001-000046	REF-CF,1.8K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R116	156.6	66.3	2001-000106	REF-CF,1.5K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R117	156.6	63.8	2001-000059	REF-CF,5.6K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R118	182	77.6	2001-000051	R-CARBON	2.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R121	189	77.5	2001-000053	REF-CF,3.3K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R122	196.5	75	2001-000048	R-CARBON	2.2Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R125	196.5	100.5	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R126	182	94.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R130	163.1	68.8	2001-000097	REF-CF,1M,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R131	198.1	61.1	2001-000553	R-CARBON	270ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R132	198.1	58.3	2001-000553	R-CARBON	270ohm,5%,1/6W,AA,TP,1.8x3.2mm	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
R133	11.3	45.4	2002-000107	R-COMPOSITION	100ohm,10%,1/2W,AA,TP,3.5x9.5m	
R134	226.1	103.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R135	226.1	106.3	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R136	136.4	153.7	2003-000704	R-METAL OXIDE(S)	47Kohm,5%,1W,AA,TP,3.3x9mm	
R138	162	120	2001-001153	R-CARBON(S)	47ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R139	165.5	109	2001-001153	R-CARBON(S)	47ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R140	131.4	50.8	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R141	153.5	114	2001-000022	R-CARBON	20Kohm,2%,1/6W,AA,TP,1.8x3.2mm	
R144	177	121.5	2001-000889	R-CARBON	6.8Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R146	182	113.5	2001-000678	R-CARBON	36Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R147	179.5	121.5	2001-000056	R-CARBON	4.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R148	158.5	123.5	2001-001153	R-CARBON(S)	47ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R149	147.5	120.5	2001-001153	R-CARBON(S)	47ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R150	153.6	100.3	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R151	216.9	104.6	2001-000056	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R161	44.5	136	2001-000043	REF-CF,1K,5%,1/6W	150V,-1300 TO +350PPM,R-AXIAL	
R162	92	142	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R163	18.2	153.4	2003-000631	R-METAL OXIDE(S)	3.3ohm,5%,3W,AA,TP,6x16mm	
R701	234.4	40.6	2001-000108	R-CARBON	18Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R702	231.7	35	2001-000088	R-CARBON	120Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R703	140.9	18.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R704	172.5	17.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R705	172.5	20.6	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R706	184.8	24	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
R707	101	23	2001-000051	R-CARBON	2.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R708	155.3	20.3	2001-000051	R-CARBON	2.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R709	184.8	20	2001-000051	R-CARBON	2.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R710	204	21.2	2001-000051	R-CARBON	2.7Kohm,5%,1/6W,AA,TP,1.8x3.2m	
R711	149.1	16.3	2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R712	124.9	18	2001-000562	R-CARBON	27Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R713	194.6	18.9	2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R714	115.9	21.3	2001-000562	R-CARBON	27Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R715	210.5	17.9	2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R716	101	19	2001-000562	R-CARBON	27Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
R717	168.8	23.5	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R718	168.8	29.4	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R719	155.4	24.2	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
R720	231.6	4.1	2001-000034	R-CARBON	220ohm,5%,1/4W,AA,TP,2.4x6.4mm	
R721	132	21.3	2001-000029	R-CARBON	100ohm,5%,1/6W,AA,TP,1.8x3.2mm	
RB01	96.4	65.5	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB02	98.9	65.5	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB04	96.6	115.8	2001-000039	R-CARBON	390ohm,5%,1/6W,AA,TP,1.8x3.2mm	
RB05	99.6	107.5	2001-000301	REF-CF,10,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB06	78	120	2001-000935	R-CARBON	68ohm,5%,1/4W,AA,TP,2.4x6.4mm	
RB07	78	142	2001-000089	REF-CF,150K,5%,1/6W	150KOHM,5%,1/6W,AA,TP,1.8X3.2MM	
RB08	178.5	144.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB09	174.7	144.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	

Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
RB10	183.5	144.5	2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
RB11	181	136.5	2001-000053	REF-CF,3.3K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB12	165.5	133	2001-000224	REF-CF,1.2M,5%,1/6W	150V,-1300 TO +350PPM/C,1.9X3.2	
RB13	172.5	124	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB14	159	127	2001-000963	REF-CF,75K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB15	198.8	90.6	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RB17	49.2	46.7	2002-000142	R-COMPOSITION	39ohm,10%,1/2W,AA,TP,3.5x9.5mm	
RB18	139	81.6	2001-000077	REF-CF,47K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG01	106.5	65.5	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG02	109	65.6	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG04	111.2	114.1	2001-000039	R-CARBON	390ohm,5%,1/6W,AA,TP,1.8x3.2mm	
RG05	108.5	107	2001-000301	REF-CF,10,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG06	71	120	2001-000935	R-CARBON	68ohm,5%,1/4W,AA,TP,2.4x6.4mm	
RG07	64.5	142	2001-000089	REF-CF,150K,5%,1/6W	150KOHM,5%,1/6W,AA,TP,1.8X3.2MM	
RG08	190.9	144.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG09	196.5	130.5	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG10	187	113.5	2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
RG11	189.5	121.5	2001-000053	REF-CF,3.3K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG12	169	141	2001-000224	REF-CF,1.2M,5%,1/6W	150V,-1300 TO +350PPM/C,1.9X3.2	
RG13	194.5	113.5	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG14	192	121.5	2001-000963	REF-CF,75K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG15	196.3	90.6	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG17	15	56.9	2002-000142	R-COMPOSITION	39ohm,10%,1/2W,AA,TP,3.5x9.5mm	
RG18	141.7	81.6	2001-000077	REF-CF,47K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RG19	108.3	120.6	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR01	119	65.5	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR02	116.6	65.5	2001-000026	REF-CF,75,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR04	119	115.1	2001-000039	R-CARBON	390ohm,5%,1/6W,AA,TP,1.8x3.2mm	
RR05	116.4	107.1	2001-000301	REF-CF,10,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR06	64	120	2001-000935	R-CARBON	68ohm,5%,1/4W,AA,TP,2.4x6.4mm	
RR07	52	142	2001-000089	REF-CF,150K,5%,1/6W	150KOHM,5%,1/6W,AA,TP,1.8X3.2MM	
RR08	171.5	140.3	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR09	193.5	144	2001-000067	REF-CF,10K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR10	188.5	144.5	2001-000069	R-CARBON	12Kohm,5%,1/6W,AA,TP,1.8x3.2mm	
RR11	186	136.5	2001-000053	REF-CF,3.3K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR12	198.5	144	2001-000224	REF-CF,1.2M,5%,1/6W	150V,-1300 TO +350PPM/C,1.9X3.2	
RR13	205.8	133.5	2001-000367	REF-CF,15K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR14	196	136	2001-000963	REF-CF,75K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR15	193.8	90.6	2001-000086	REF-CF,100K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
RR17	30.6	16.8	2002-000142	R-COMPOSITION	39ohm,10%,1/2W,AA,TP,3.5x9.5mm	
RR18	144.6	81.6	2001-000077	REF-CF,47K,5%,1/6W	150V,-1300 TO +350PPM/C,R-AXIAL	
SK1	33.4	53.4	3704-001036	SOCKET-CRT	13P,15.24PI,29PI,NI+SN	
SK101	34.3	31.8	4715-000102	SURGE ABSORBER	200V,20%,1000A,RADIAL	
SK102	18.4	57	4715-000102	SURGE ABSORBER	200V,20%,1000A,RADIAL	
SK103	49.2	50.5	4715-000102	SURGE ABSORBER	200V,20%,1000A,RADIAL	
SK104	11.7	50.5	4715-000001	SURGE ABSORBER	1KV,+50-10%	
SW1	209	10	3404-000243	SWITCH-TACT	15V,20mA,160gf+-50gf,6x3.4mm,S	

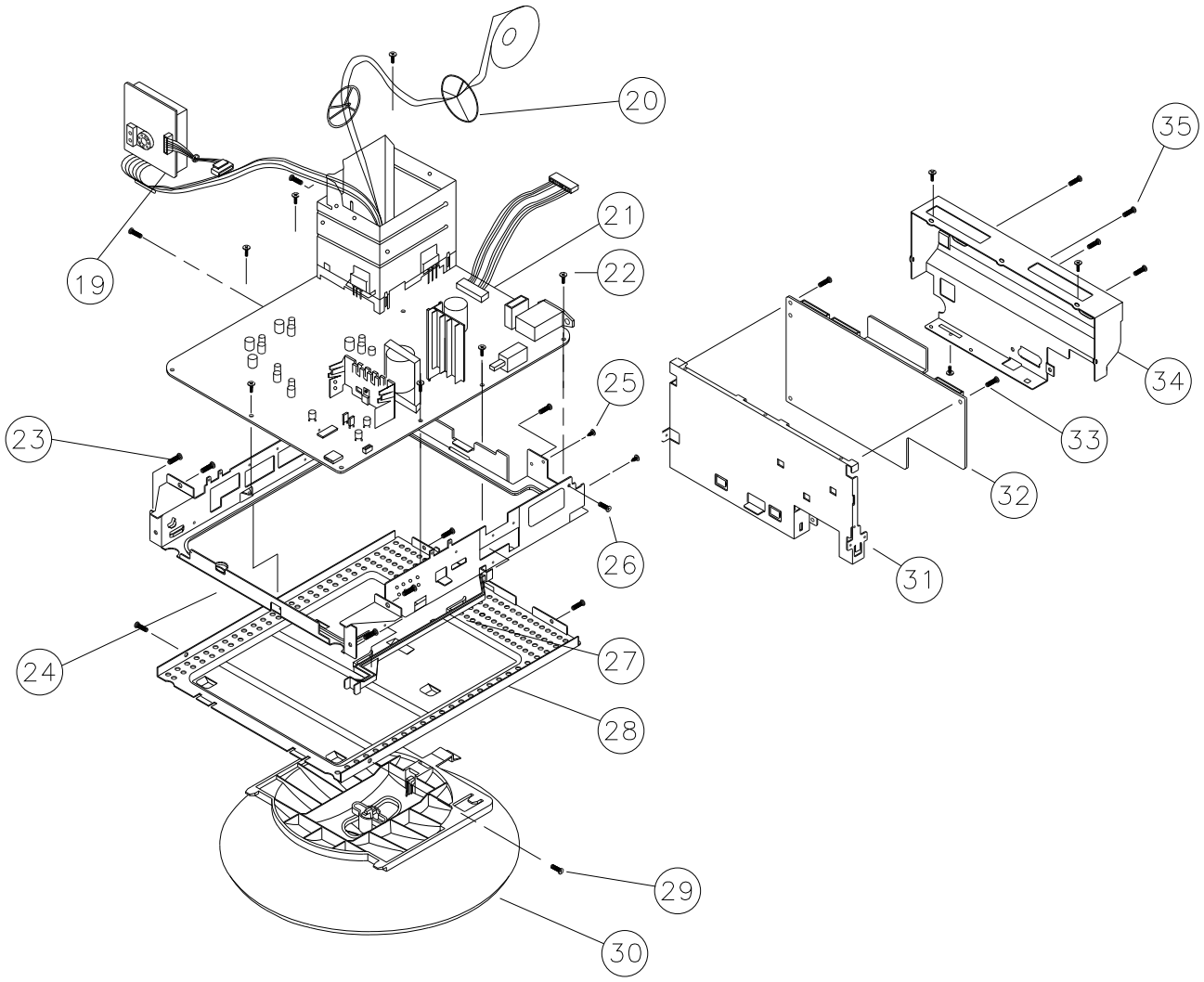
Loc. No.	Coordinates (X,Y)		New Code No.	Description	Specification	Remarks
SW10	83	10	3404-000243	vr3	1/20W	
SW2	195	10	3404-000243	SWITCH-TACT	15V,20mA,160gf+-50gf,6x3.4mm,S	
SW3	176	10	3404-000243	SWITCH-TACT	15V,20mA,160gf+-50gf,6x3.4mm,S	
SW4	92	10	3404-000243	SWITCH-TACT	15V,20mA,160gf+-50gf,6x3.4mm,S	
SW5	111	10	3404-000243	SWITCH-TACT	15V,20mA,160gf+-50gf,6x3.4mm,S	
SW6	134	10	3404-000243	SWITCH-TACT	15V,20mA,160gf+-50gf,6x3.4mm,S	
SW7	153	10	3404-000243	SWITCH-TACT	15V,20mA,160gf+-50gf,6x3.4mm,S	
SW8	162	10	3404-000243	SWITCH-TACT	15V,20mA,160gf+-50gf,6x3.4mm,S	
SW9	120	10	3404-000243	SWITCH-TACT	15V,20mA,160gf+-50gf,6x3.4mm,S	
VR701			2101-001008	vr3	1/20W	
VR702	228.1	9.5	2101-001008	vr3	1/20W	
ZD101	153.5	57.5	0403-000005	0.5W,10MA	DIODE-ZEN,UZ-5.1B,DO-3	
ZD102	160	57.5	0403-000005	0.5W,10MA	DIODE-ZEN,UZ-5.1B,DO-35	
ZD105	123.5	58.5	0403-000005	0.5W,10MA	DIODE-ZEN,UZ-5.1B,DO-35	

Others

Loc. No.	Code No.	Description	Specification	Remarks
CRT	BH03-10337T	CRT-COLOR	M41KUN36X03(E/L/LP) Silica Coating	
	BH03-10337U	CRT-COLOR	M41KUN36X03(A/L/LP) Multi Coating	
	BH03-10337V	CRT-COLOR	M41KUN36X03(T4/L/LP) TCO Coating	
CRT GND	BH39-40362C	CBF-CRT GROUND	1P,320MM,BLK,UL1015,AWG18	
D-COIL	BH27-10335Y	DEGAUSSING COIL	CKG7507L	
PROCESS-PBA UNIT	BH94-30010F	ASS'Y PCB	CKG7507	
	BH94-30011K	ASS'Y PCB	CKG7507,TSE,THAILAND	
	BH94-30011V	ASS'Y PCB	CKG7507GB1/XEM	
P/CORD	BH39-10339Z	CBF-POWER/CORD	DET,RVV3,250V/10A.BLK,18	CHINA
	BH39-10005A	CBF-POWER/CORD	CAP,1200MM,250V/10A,IVY	UK,THAILAND
	BH39-10007A	CBF-POWER/CORD	WALL,1830MM,250V/6A,IVY	SEG,SESA,SEF
	BH39-10339E	CBF-POWER/CORD	DET,SVT,125V 7A/10A,IVY	SEA,SECA
	BH39-10006A	CBF-POWER/CORD	WALL,1830MM,250V/10A,IVY	SEAU
SIGNAL CABLE	BH39-20336M	CBF-SIGNAL	DET,1830MM,15P/15P,IVORY,UL	
B/D ASS'Y CODE	BH98-10010B	ASS'Y PCB MAIN	NORMAL	
	BH98-10011D	ASS'Y PCB MAIN	THAILAND,RUSSIA	
	BH98-10011P	ASS'Y PCB MAIN	CKG7507GB1/XEM	
	BH98-20004K	ASS'Y PCB VIDEO	NORMAL	

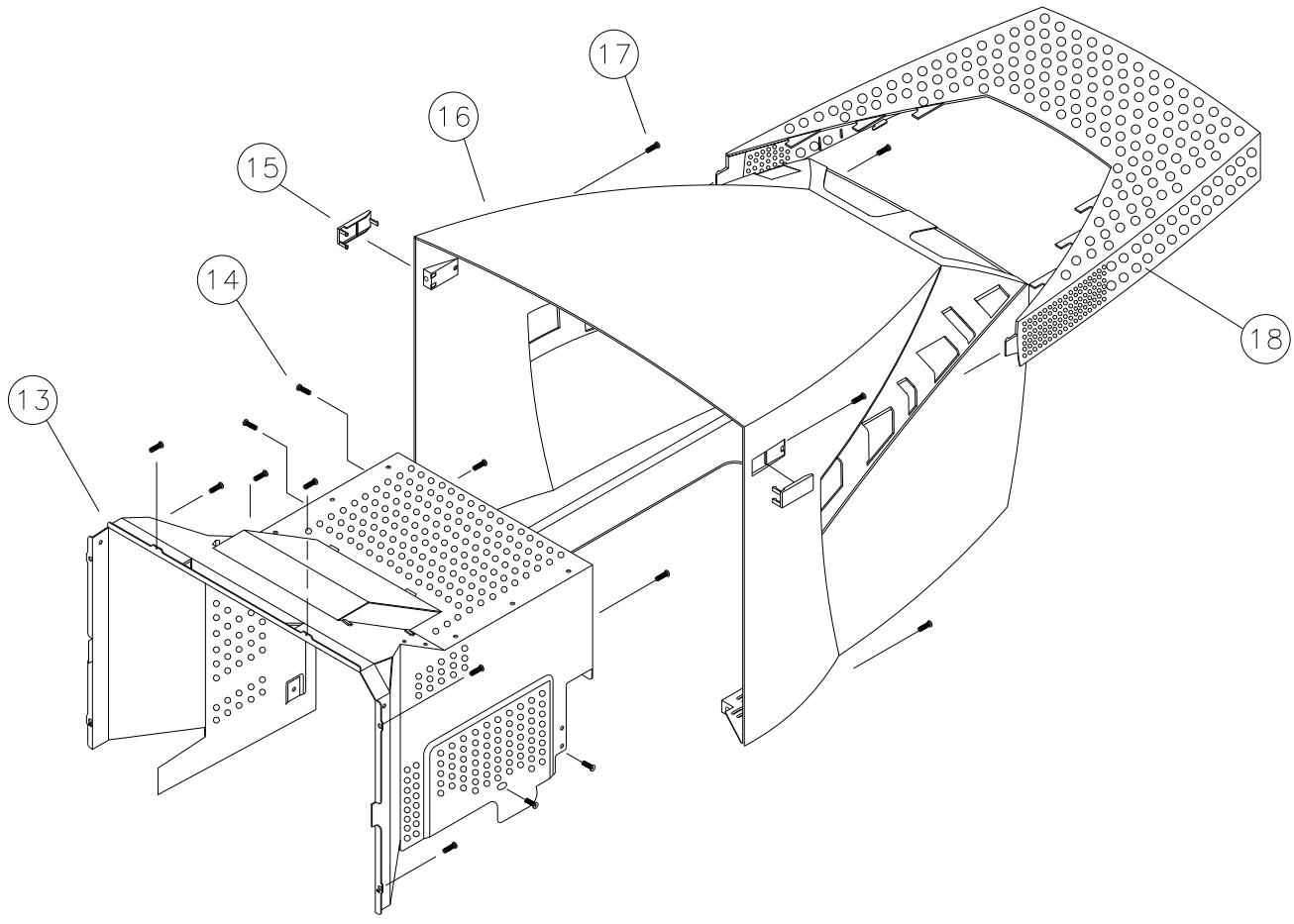
8-2 Chassis & Stand Ass'y

NO	DESCRIPTION	CODE NO	SPECIFICATION	Q'TY	REMARK
19	ASS'Y-CDT PCB	BH98-20004K	CKG7507	1	
20	LOCKER-WIRE	BH64-30002A	NYLON66	2	
21	ASS'Y-PCB	BH98-10010B	CKG7507	1	
22	SCREW-TAPTITE	6003-000010	BWH,D3,L10	7	
23	SCREW-TAPTITE	6003-000009	BH,D4,L16	4	
24	BRKT-PCB	BH70-10514A	SECC T1.0	1	
25	SCREW-TAPPING	6002-000129	FH,D3,L8	2	
26	SCREW TAPTITE	6003-000015	BH,D3,L8	3	
27	SHAFT-POWER	BH72-60447A	ABS+PC IV01	1	
28	BRKT-PCB BOTTOM	BH70-10419A	SECC T1.0	1	
29	SCREW TAPTITE	6003-000015	BH,D3,L8	4	
30	UNIT/STAND-ASS'Y	BH75-10605A	CKG7507	1	
31	BRKT-VIDEO	BH70-10414A	SECC T0.8	1	
32	ASS'Y-VIDEO PCB	BH98-20004K	CKG7507	1	
33	SCREW-TAPTITE	6003-000010	BWH,D3,L10	2	
34	SHIELD-VIDEO	BH71-10406A	A1050S H14 T1.6	1	
35	SCREW-TAPTITE	6003-000015	BH,D3,L8	7	



8-3 Rear Cover Ass'y

NO	DESCRIPTION	CODE NO	SPECIFICATION	Q'TY	REMARK
13	UNIT/SHIELD-ASS'Y	BH75-10605A	CKG7507	1	
14	SCREW-TAPTITE	6003-000015	BH,D3,L8	12	
15	CAP-SCREW	BH72-60448F	ABS HB IV16	2	
16	COVER-REAR	BH72-60443S	ABS HB IV16	1	NON MULTI-MEDIA
		BH72-60443V	ABS HB IV16	1	MULTI-MEDIA
17	SCREW-TAPTITE	6003-000009	BH,D4,L16	4	
18	COVER-REAR TOP	BH72-60444E	ABS HB IV16	1	



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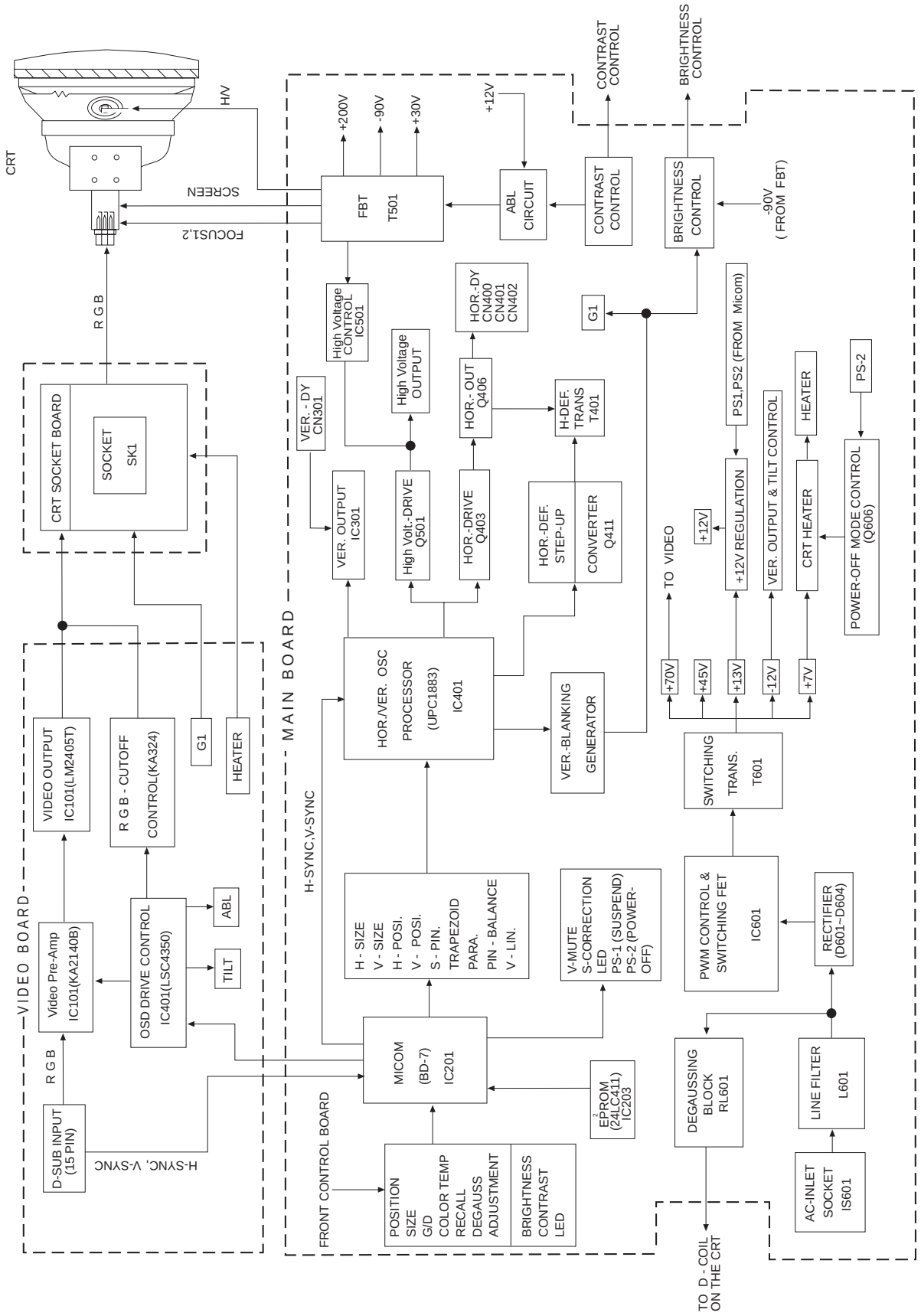
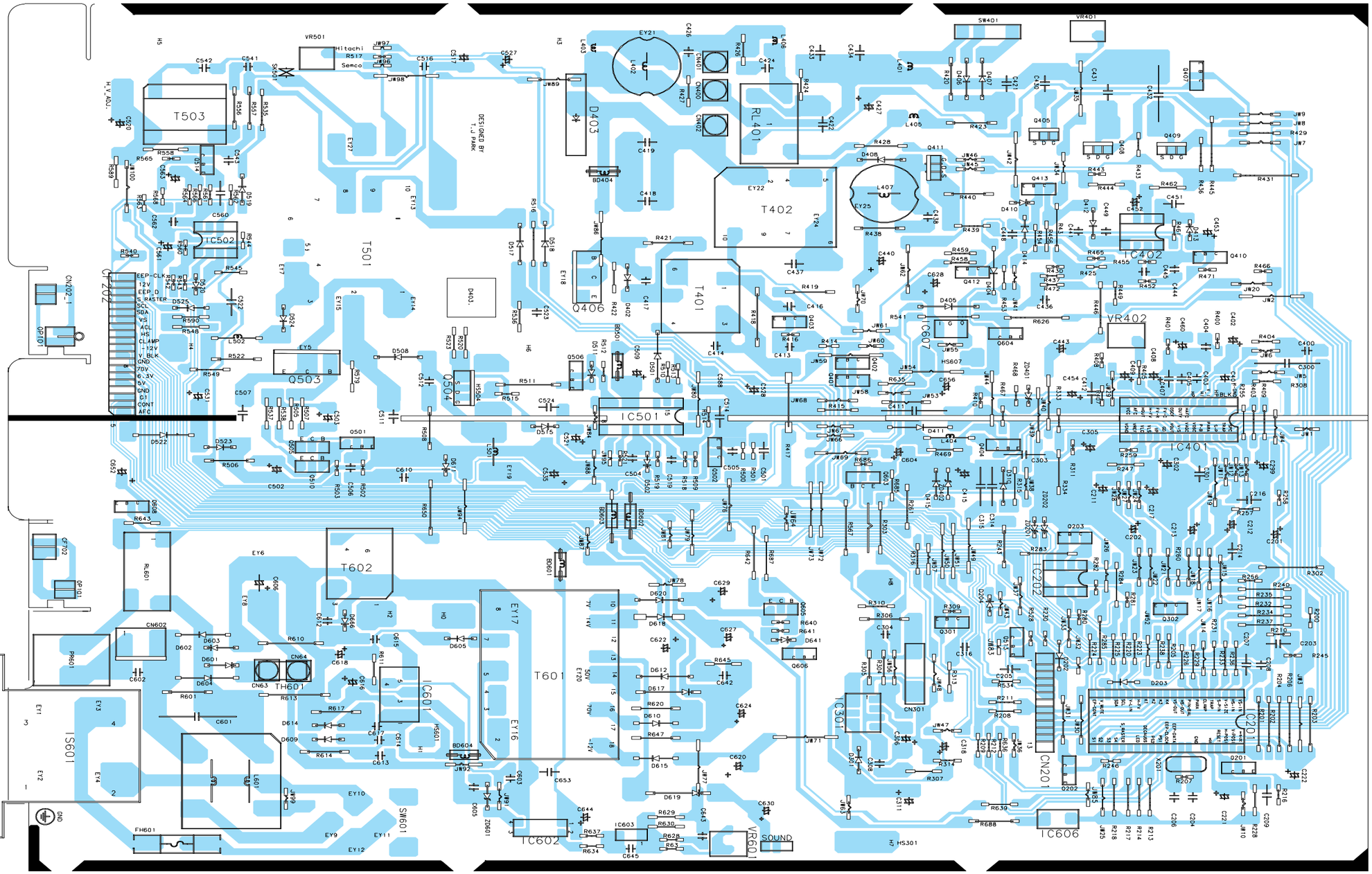
10 Block Diagram



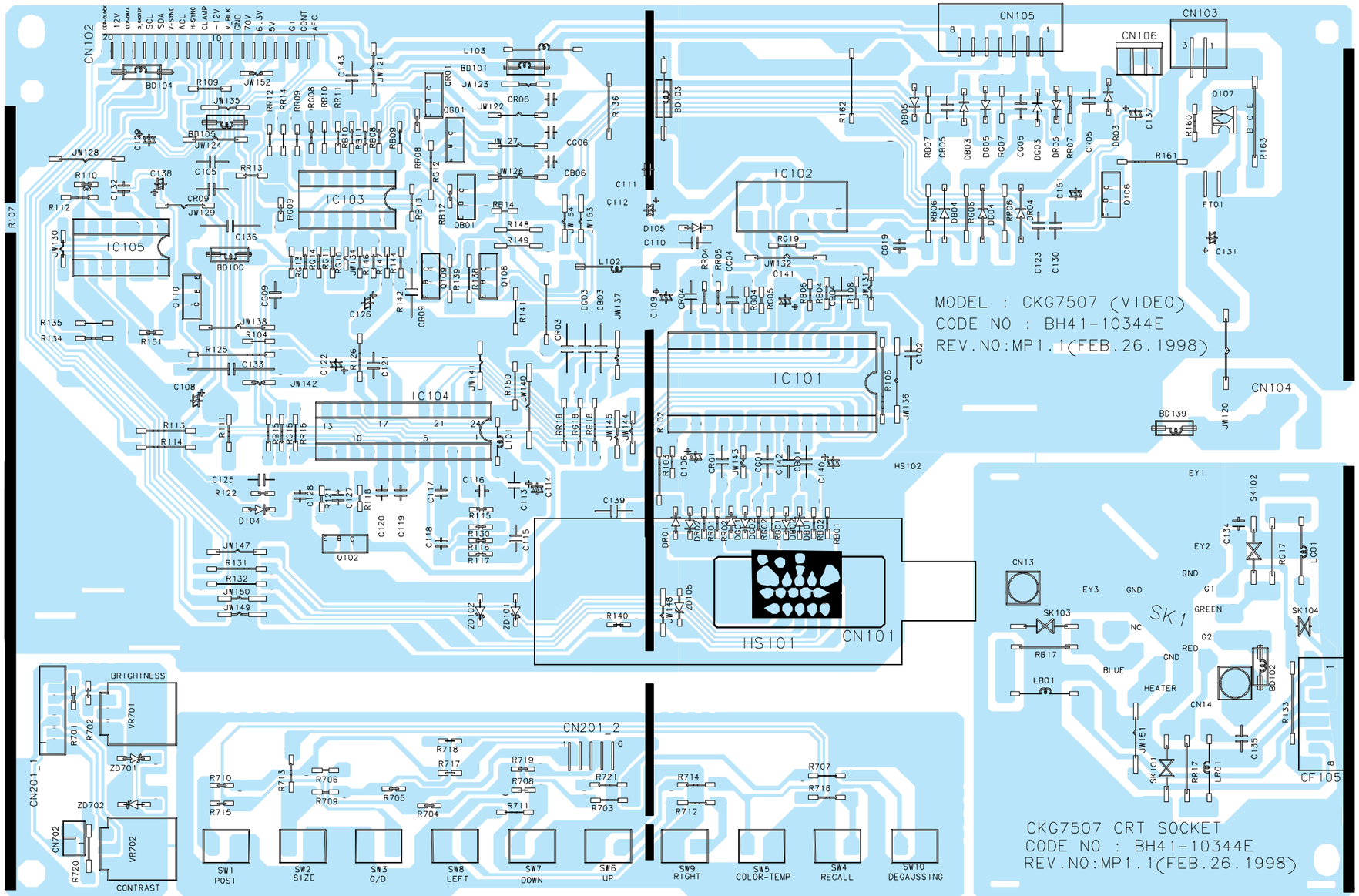
Memo

11 PCB Diagrams

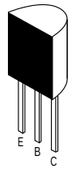
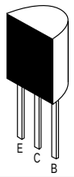
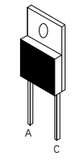
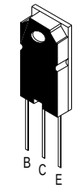
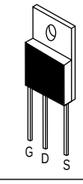
11-1 Main PCB (Bottom View)

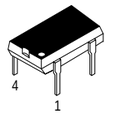
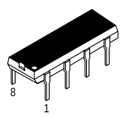
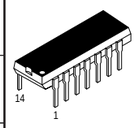
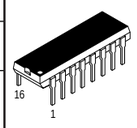
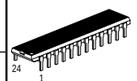
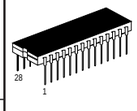
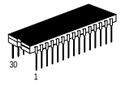
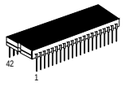


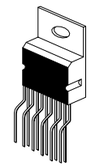
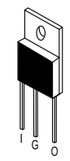
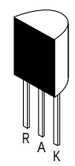
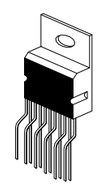
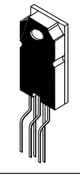
11-2 Video PCB (Bottom View)



11-3 Semiconductor Lead Identification

PARTS	TYPE NO.	REF. NO.
	KSC945/ KSC815	Q106, Q108, Q110, Q201, Q202, Q203, Q301, Q302, Q604, Q606
	2N3904	Q401, Q412, Q413, Q501
	2N3906	Q402
	MPSA42	Q514, QR01, QG01, QB01, Q403, Q514
	KSA733	Q109, Q410, Q506, Q513
	MPS222A	Q502
	MPS3646	Q102
	KSD1616/ KSC2316	Q510
	KSB1116/ KSA916	Q505, Q603, Q605
	KSC1008	Q404, Q407, Q608
	YG123S15/ FMQG2FS/ 5TZ52	D403
	KSC5088	Q406
	KSC5386/ 2SC5149	Q503
	IRF740	Q504
	IRF630	Q411
	IRF/U230A	Q405, Q408, Q409

PARTS	TYPE NO.	REF. NO.
	LTV-817	IC602
	KA358	IC502
	KA3883	IC402
	74HCT14A	IC105
	KA324	IC103
	TL494	IC501
	LSC4350	IC104
	KA2140B	IC101
	UPC1883	IC401
	68HC705	IC201

PARTS	TYPE NO.	REF. NO.
	TDA9302H	IC301
	KA7805	IC606
	KA7812	IC607
	KA431	IC603
	LM2405	IC102
	KA2S0680	IC601

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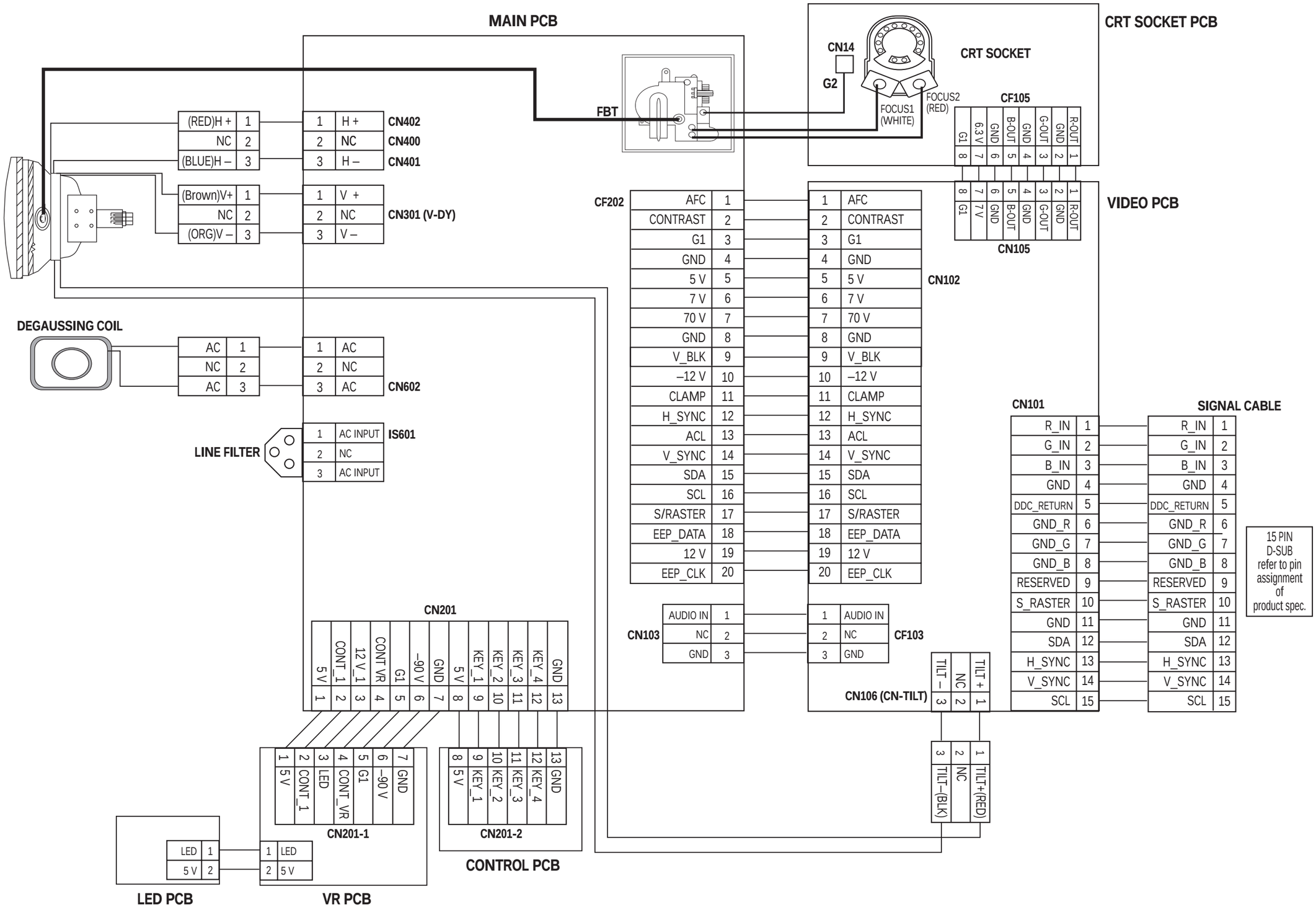
12 Wiring Diagram



13 Schematic Diagrams

13-1 Power Part Schematic Diagram

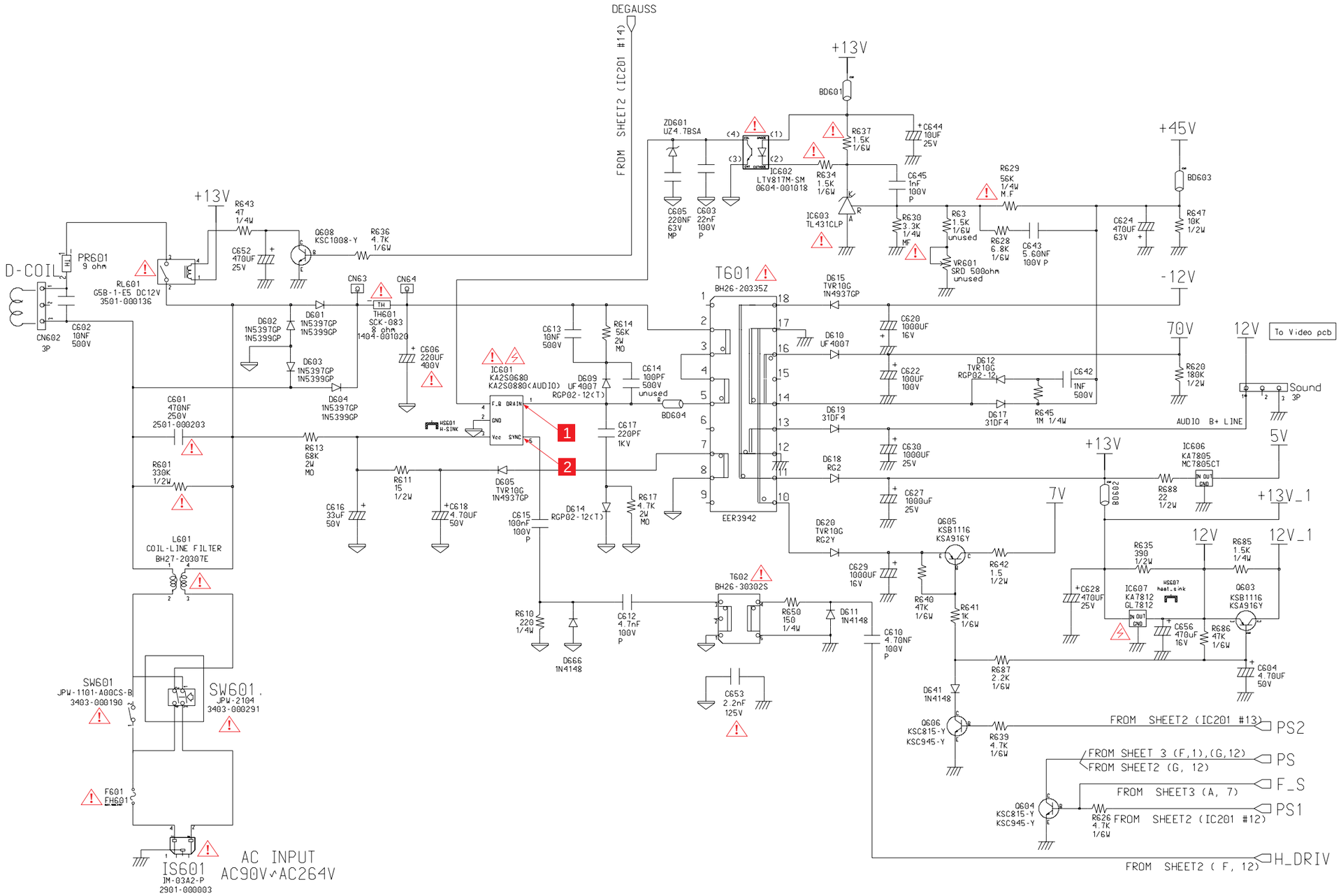


Table 13-1. IC601 (KA0680)

pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	194.6	186
2	GND	GND
3	19.8	18
4	3.8	2.3
5	6.2	5

Unit: Vrms

Table 13-2. IC602 (TV817M)

pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	15	14.6
2	13.8	13.6
3	GND	GND
4	2	2.5

Unit: Vrms

Table 13-3. IC603 (TL431CLP)

pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	2.5	2.5
2	GND	GND
3	12.5	12.6

Unit: Vrms

Table 13-4. IC606 (MC7805)

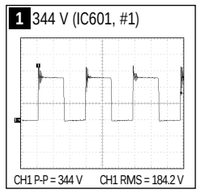
pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	14.4	14.4
2	0	0
3	5	5

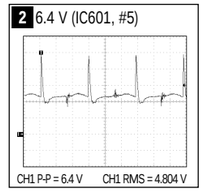
Unit: Vrms

Table 13-5. IC607 (GL7812)

pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	15	15
2	0	0
3	12	12

Unit: Vrms





13-2 Micro Processor & Vertical Deflection Part Schematic Diagram

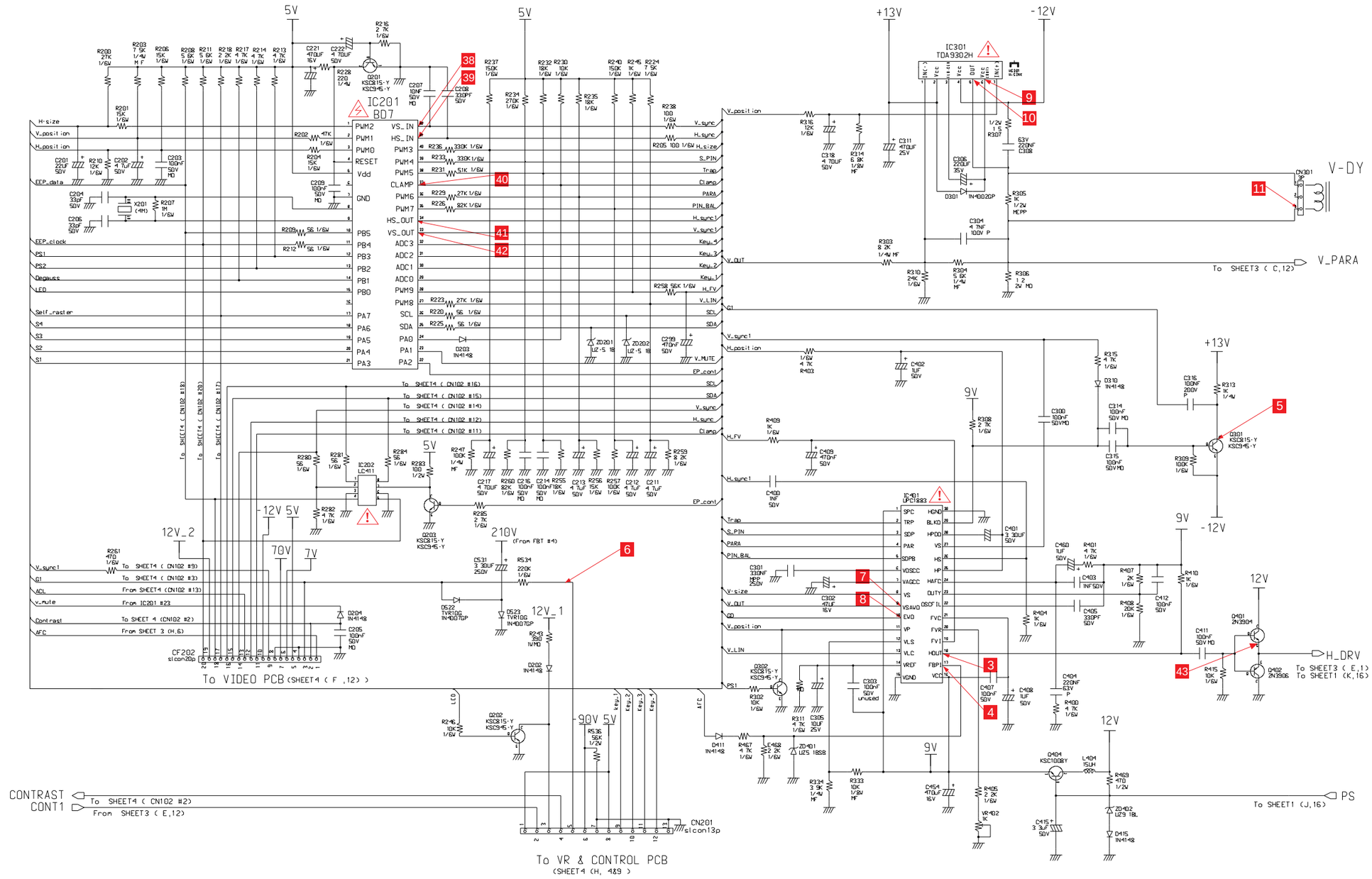


Table 13-6. IC201 (BD7)

pin #	MODES		pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz		1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	3.4	3.7	22	0	0
2	3.6	3.5	23	4.9	5.1
3	3.3	3.4	24	5	5.1
4	5	5	25	1.6	1.4
5	5	5	26	3.5	3.5
6	–	–	27	1.8	1.5
7	GND	GND	28	3.5	2.7
8	2.9	3	29	4.9	4.9
9	2.8	2.8	30	4.9	4.9
10	5	5	31	4.9	4.9
11	5	5	32	4.9	4.9
12	0	0	33	0.2	0.3
13	2.8	2.8	34	1.4	1.7
14	0	0	35	3.7	3.9
15	0	0	36	3.9	3.8
16	–	–	37	3.3	4.9
17	0.2	0.2	38	3.4	3.5
18	0.1	5.2	39	3.4	4
19	0.1	5.2	40	2.8	2.43
20	0.1	5.2	41	1.4	4.7
21	0.1	5.2	42	0.2	4.9

Unit: Vrms

Table 13-7. IC202 (24LC41)

pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	3.5	3.4
2	0.2	4.6
3	GND	GND
4	5	4.7
5	5	4.7
6	GND	GND
7	5	4.7
8	2.1	2.1

Unit: Vrms

Table 13-8. IC301 (TDA9302)

pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	1.24	1.2
2	14.9	14.7
3	12.5	12.5
4	–12.7	–12.6
5	4.9	6.5
6	14.5	14.8
7	1.2	1.1

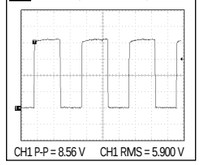
Unit: Vrms

Table 13-9. IC401 (UPC1883)

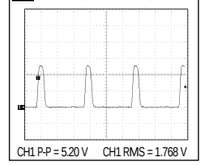
pin #	MODES		pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz		1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	9.1	9.1	16	9.1	9.1
2	2.5	2.5	17	2.2	1.6
3	1.3	1.5	18	6.1	6.2
4	2.5	2.4	19	2.7	1.2
5	2.4	2.4	20	2.5	1.2
6	4.2	4.2	21	2.5	1.5
7	3.1	2.9	22	8.3	0.4
8	1.9	1.9	23	8.3	8.3
9	3.6	3.6	24	3.3	3.3
10	3.5	3.5	25	2.1	2.2
11	3.5	3.4	26	0.6	0.6
12	2.6	2.5	27	3.6	3.6
13	2.4	2.4	28	2.4	2.4
14	5	4.9	29	4.3	4.3
15	GND	GND	30	GND	GND

Unit: Vrms

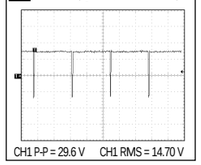
3 8.56 V (IC401, #18)



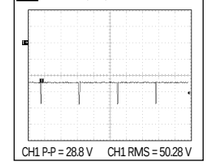
4 5.20 V (IC401, #17)



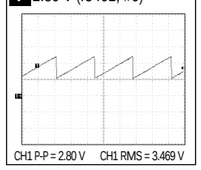
5 29.6 V (Q301, Collector)



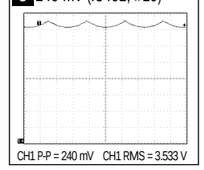
6 28.8 V (G1)



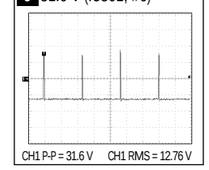
7 2.80 V (IC401, #9)



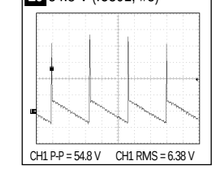
8 240 mV (IC401, #10)



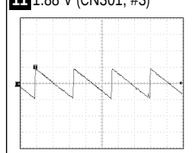
9 31.6 V (IC301, #6)



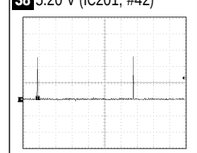
10 54.8 V (IC301, #5)



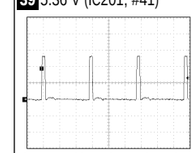
11 1.88 V (CN301, #3)



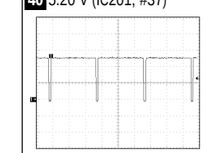
38 5.20 V (IC201, #42)



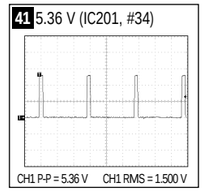
39 5.36 V (IC201, #41)



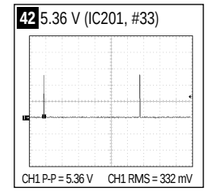
40 5.20 V (IC201, #37)



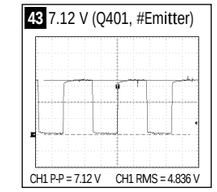
41 5.36 V (IC201, #34)



42 5.36 V (IC201, #33)



43 7.12 V (Q401, #Emitter)



13-3 Horizontal Deflection & High Voltage Part Schematic Diagram

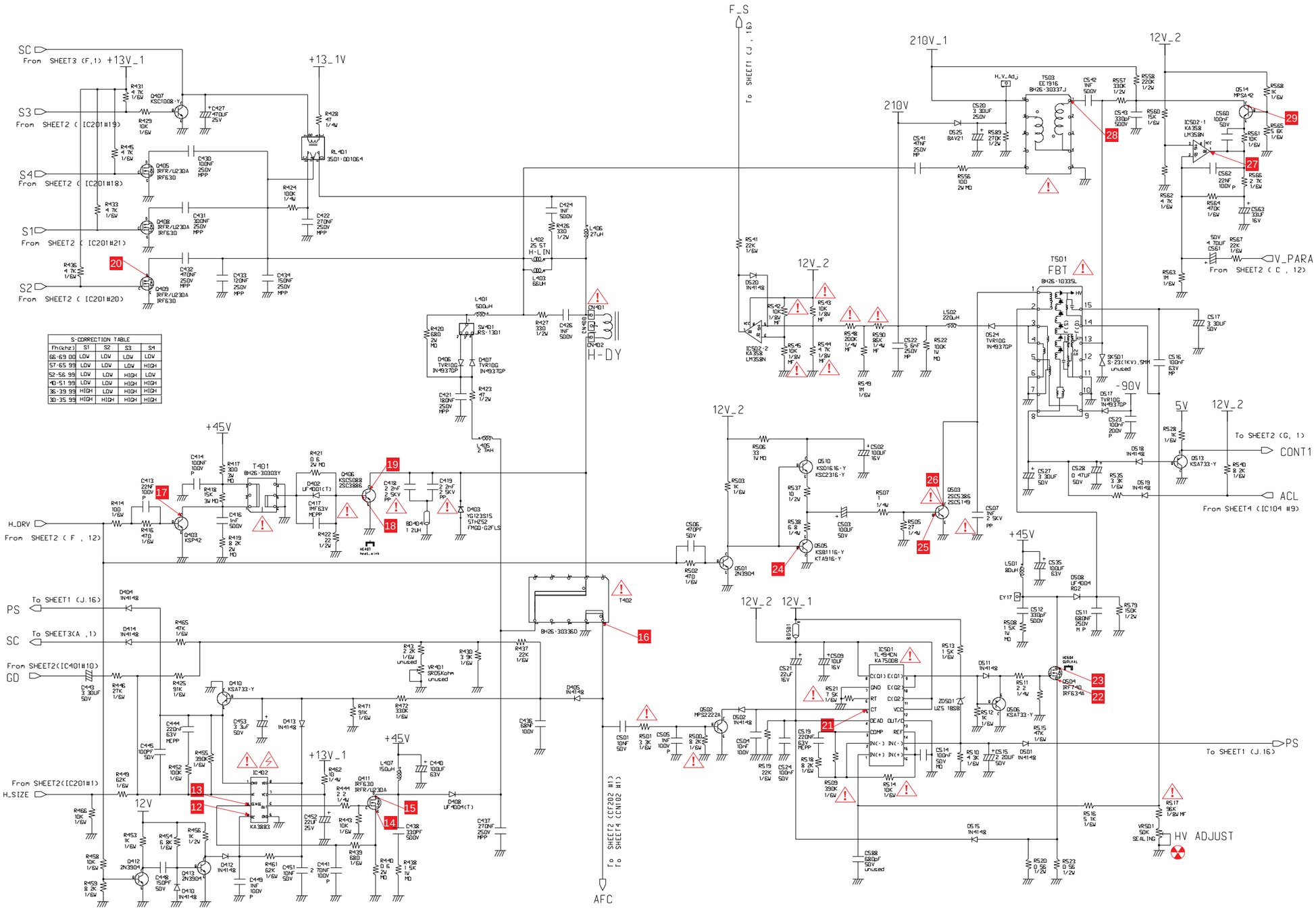


Table 13-10. IC402 (KA3883)

pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	3.2	1.8
2	2.5	2.5
3	0.2	0
4	1.4	1.8
5	GND	GND
6	9.1	4
7	14.8	14.7
8	5	5

Unit: Vrms

Table 13-11. IC501 (KA7500)

pin #	MODES		pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz		1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	4.8	4.8	9	6.5	4.1
2	4.8	4.8	10	6.5	4.1
3	1.7	2.4	11	12	12.1
4	0.2	0.1	12	12	12.1
5	0.9	1.3	13	0	0
6	3.5	3.4	14	4.9	4.9
7	GND	GND	15	5.5	5.6
8	12	12.1	16	4.9	4.9

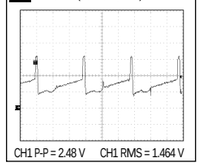
Unit: Vrms

Table 13-12. IC502 (LM358N)

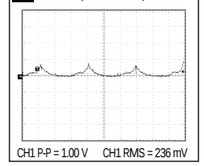
pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	3.9	5.4
2	2.9	2.8
3	2.9	2.8
4	GND	GND
5	5.6	5.7
6	5.9	5.9
7	0	0
8	12	11.7

Unit: Vrms

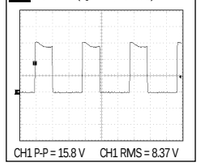
12 2.48 V (IC402, #4)



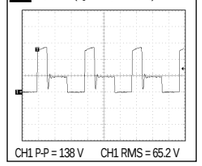
13 1.00 V (IC402, #3)



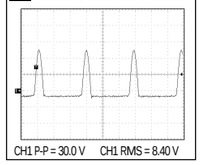
14 15.8 V (Q411, Gate)



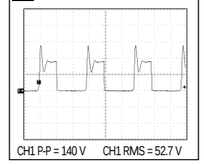
15 138 V (Q411, Drain)



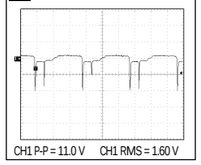
16 30.0 V (T402, #10)



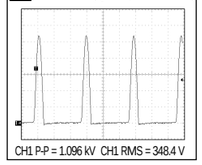
17 140 V (Q403, Collector)



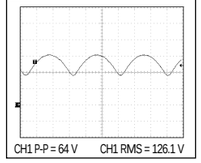
18 11.0 V (Q406, Base)



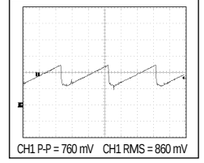
19 1.096 kV (Q406, Collector)



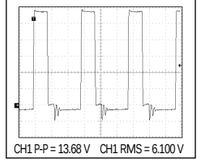
20 64 V (Q409, Drain)



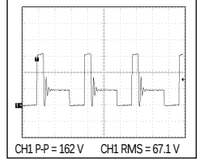
21 760 mV (IC501, #5)



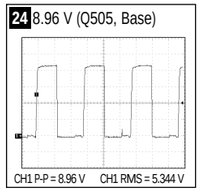
22 13.68 V (Q504, Gate)



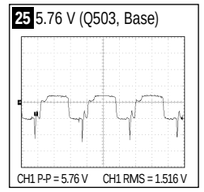
23 162 V (Q504, Drain)



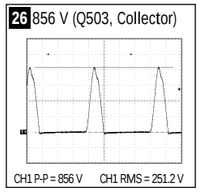
24 8.96 V (Q505, Base)



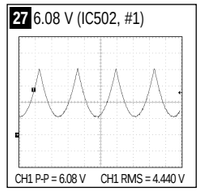
25 5.76 V (Q503, Base)



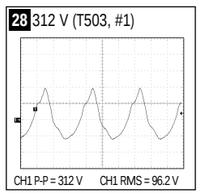
26 856 V (Q503, Collector)



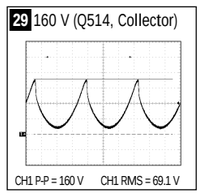
27 6.08 V (IC502, #1)



28 312 V (T503, #1)



29 160 V (Q514, Collector)



13-4 Video & Control Part Schematic Diagram

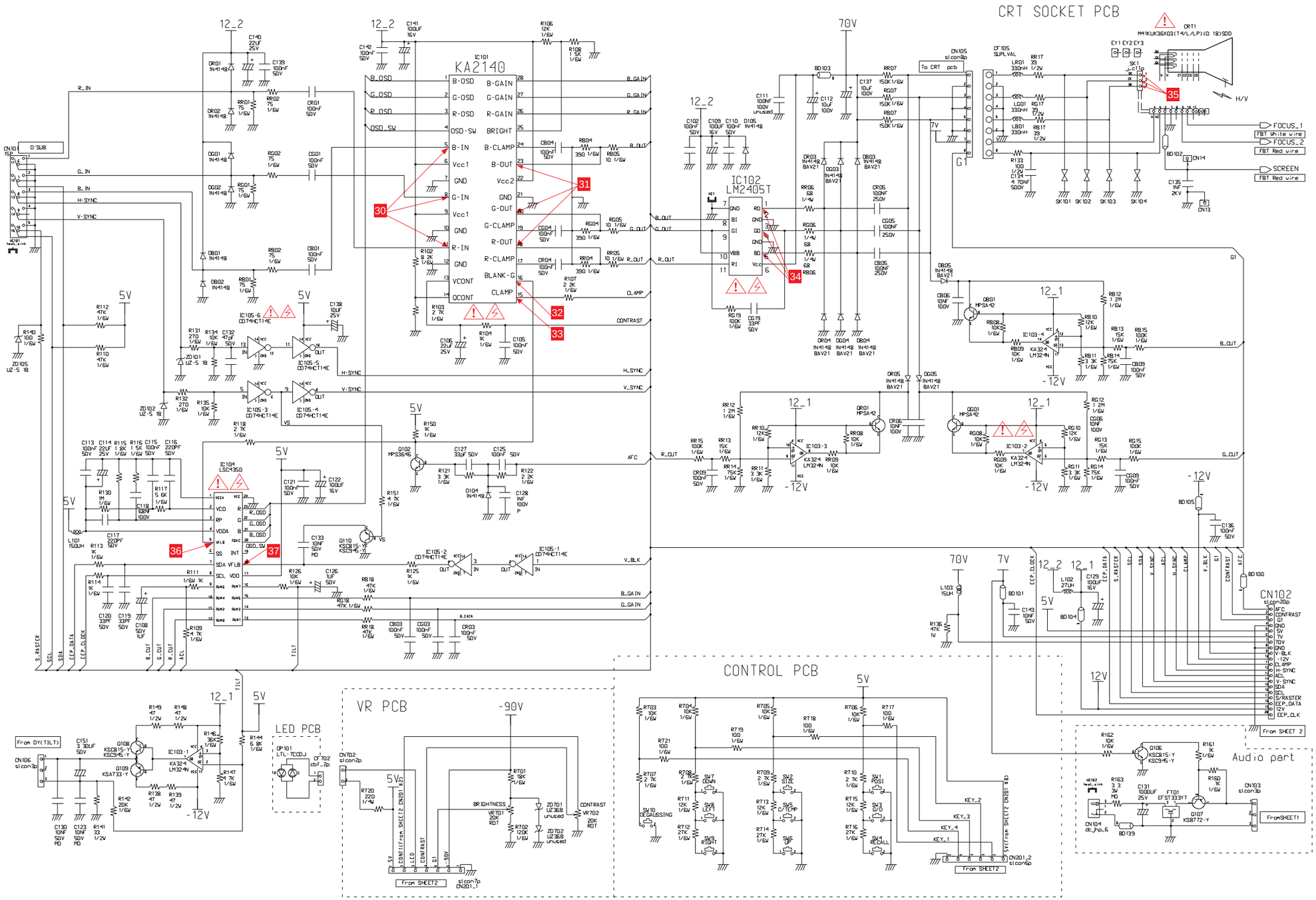


Table 13-13. IC101 (KA2140)

pin #	MODES		pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz		1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	1.4	1.4	15	4.8	4.9
2	1.4	1.4	16	4.4	4.7
3	1.4	1.4	17	5.2	5.2
4	0.1	0.8	18	3	3.2
5	2.5	2.5	19	5.1	5.1
6	12	1.8	20	2.9	3.1
7	GND	GND	21	GND	GND
8	2.5	2.5	22	12	11.9
9	12	11.8	23	2.9	3
10	GND	GND	24	5.2	5.2
11	2.5	2.5	25	1.3	1.3
12	GND	GND	26	1.3	1.3
13	3	3.12	27	1.2	1.2
14	2.8	2.9	28	1.1	1.1

Unit: Vrms

Table 13-14. IC102 (LM2405T)

pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	45.6	40
2	GND	GND
3	46.2	41
4	GND	GND
5	46.6	41
6	73.1	73.1
7	GND	GND
8	2.9	3.1
9	2.9	3.1
10	12	12
11	3	3.2

Unit: Vrms

Table 13-15. IC103 (LM324N)

pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	1	1
2	2.4	2
3	2.4	2
4	12	12
5	2.6	2.6
6	2.6	2.6
7	7.3	7.4
8	7.7	7.8
9	2.5	2.5
10	2.5	2.5
11	–12.6	–12.6
12	2.2	2.5
13	2.5	2.5
14	7.3	7.3

Unit: Vrms

Table 13-16. IC104 (LSC4350)

pin #	MODES		pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz		1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	0.1	0	13	2.8	2.6
2	3.8	1.4	14	2.6	2.5
3	1.8	1.4	15	2.6	2.4
4	5	5	16	3.8	4
5	5	4.8	17	5	5
6	0	0	18	0.2	0.2
7	5	5	19	0	0
8	5	5	20	0.1	0.1
9	4.5	4.6	21	1.4	1.4
10	3.5	3.4	22	1.4	1.4
11	3.3	3.1	23	1.4	1.4
12	2.4	2.4	24	GND	GND

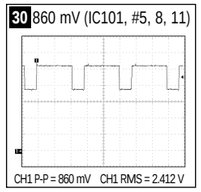
Unit: Vrms

Table 13-17. IC105 (74HCT14)

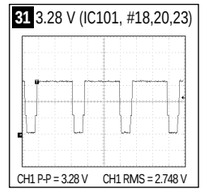
pin #	MODES	
	1024 x 768 / 85 Hz	640 x 480 / 60 Hz
1	0.3	0.3
2	5	5
3	5	5
4	0.2	2
5	0.2	4.7
6	5	0.3
7	gnd	gnd
8	0.2	4.9
9	5	0.3
10	1.4	4.7
11	4.8	1.7
12	4.8	1.7
13	1.3	4.4
14	5	5

Unit: Vrms

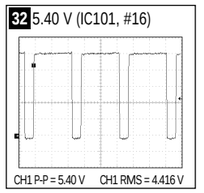
30 860 mV (IC101, #5, 8, 11)



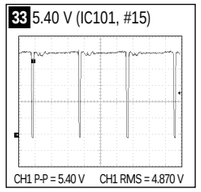
31 3.28 V (IC101, #18,20,23)



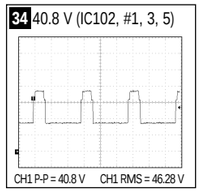
32 5.40 V (IC101, #16)



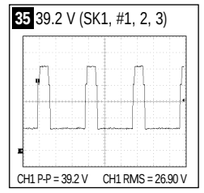
33 5.40 V (IC101, #15)



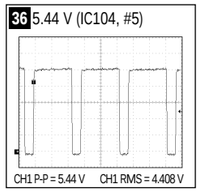
34 40.8 V (IC102, #1, 3, 5)



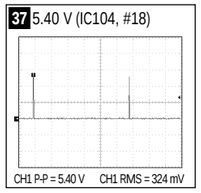
35 39.2 V (SK1, #1, 2, 3)



36 5.44 V (IC104, #5)



37 5.40 V (IC104, #18)



Memo